BLOOMFIELD COLLIERY

Quarterly Noise Monitoring and Compliance Assessment
Quarter 3 2018

Prepared for:

Bloomfield Collieries
Four Mile Creek Road
Ashtonfield NSW 2323

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Bloomfield Collieries (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.01053-R02-v1.0	11 January 2019	Martin Davenport	Nicholas Vandenberg	Martin Davenport

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1 Introduction

1.1 Background

Bloomfield Collieries Pty Ltd (Bloomfield) has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct daytime, evening and night-time noise monitoring for the Bloomfield Colliery in accordance with the Project Approval requirements set by the Department of Planning and Environment (DP&E). This noise monitoring has been conducted in conjunction with the September 2018 quarterly monitoring for Abel and Donaldson Coal Mines (refer SLR Report Q71 630.01053-R1).

1.2 Objectives of this Report

The objectives of the noise monitoring survey for this quarter were:

- Measure the ambient noise levels at five noise sensitive locations surrounding the colliery during the daytime, evening and night-time period. Noise surveys comprising of both unattended, continuous noise monitoring and operator attended monitoring were conducted.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of the individual noise sources.
- Assess the noise emissions of Bloomfield Colliery and determine compliance with respect to the Consent Conditions contained in the Project Approval.

1.3 Acoustic Terminology

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

2 Project Approval and Consent Conditions

Project Approval was granted in August 2018 for the Bloomfield Mine - MOD 4 extension (PA 07_0087).

PA 07_0087 allows Bloomfield to:

- Extract up to 1.3 Million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until December 2030.
- Transport this coal to the existing Bloomfield Coal Handling and Preparation Plant (CHPP).
- Progressively rehabilitate the site.

It is noted that Bloomfield CHPP operations are consented under the Abel Coal Mine Project Approval.

The relevant conditions relating to noise from the PA 07_0087 are reproduced below:

Schedule 3 NOISE

Noise Impact Assessment Criteria

The Proponent shall ensure that the noise generated by the project does not exceed at any residence on privately-owned land, or on more than 25% of any privately-owned land, the noise impact assessment criteira shown in Table 1 for the monitoring location nearest to that residence or land:

Table 1 Operator Noise Impact Assessment Criteria

Morning Shoulder	Day	Evening	Night		Location and Locality	
$L_{Aeq(15minute)}$	$L_{Aeq(15minute)}$	$L_{Aeq(15minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1minute)}$		
40	35	35	35	45	E	Browns Road, Black Hill
42	35	35	35	45	F	Black Hill Road, Black Hill
43	39	42	37	45	G	Buchanan Road, Buchanan
35	35	35	35	45	H	Mt Vincent Road, Louth Park
35	35	35	35	45	L	Kilshanny Avenue, Ashtonfield
48	39	39	37	46	M	John Renshaw Drive, Buttai
43	42	42	35	46	N	Lings Road, Buttai

Notes

- *To interpret the locations in Table 1, see Appendix 2.*

However, if the Proponent has a written negotiated noise agreement with the landowner of any land, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 on that land in accordance with the negotiated noise agreement.

Cumulative Noise Criteria

2. The Proponent must take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on, or on more than 25 percent of, any privately owned land:

• LAeq(11 hour) 50 dB(A) – Day;

• LAeq(4 hour) 45 dB(A) – Evening; and

• LAeq(9 hour) 40 dB(A) – Night.

3 Noise Monitoring Methodology

3.1 General Requirements

The operational noise monitoring program was conducted with reference to PA 07_0087, and in accordance with SLR Report 630.01573-R3v4.1 dated 2 November 2018 (*Bloomfield Coal Project Noise Monitoring Program)* and AS 1055:1997 *Acoustics - Description and Measurement of Environmental Noise*.

3.2 Monitoring Location

Noise monitoring is conducted at five (5) locations representative of the nearest most potentially impacted residential receivers. The details of the monitoring locations are given in **Table 2.**

Table 2 Noise Monitoring Locations

Noise Monitoring Locations	Description
F	Lot 684 Black Hill Road, Black Hill
G	156 Buchanan Road, Buchanan
L	Kilshanny Avenue, Ashtonfield
M	John Renshaw Drive, Buttai
N	Lings Road, Buttai

A site map identifying the assessment and noise monitoring locations is presented in **Appendix B**.

3.3 Unattended Continuous Noise Monitoring

An environmental noise logger was deployed for a minimum of a seven day period between Thursday 20 September 2018 and Sunday 30 September 2018 at each of the five (5) nominated locations given in **Table 2.**

All unattended monitoring equipment was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and L_{Aeq}. The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the 15 minute interval. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period. The L_{Amax} is the maximum noise level recorded over the interval.

Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dB.

3.4 Operator Attended Noise Monitoring

Operator attended noise surveys were conducted at each of the five noise monitoring locations during the day, evening and night-time periods to identify and quantify sources of noise that contributed to the overall ambient noise level. The measurements were conducted over a 15 minute period using an integrating sound level meter.

4 Operator Attended Noise Monitoring

4.1 Equipment Location

The locations and details of the plant operating on the Bloomfield open cut mine during the operator attended noise monitoring period are shown in **Table 3** and **Figure 1**.

Table 3 Operations Log

Date	Plant		Work Location		
			Day Shift	Afternoon Shift	Night Shift
25/09/2018	Production	5500 (Digger)	-	BUTT E and Coal	Washing and 992 work at parkup area
		SK75 (Drill)	-	EX03 C3	-
		SK50 (Drill)	-	-	-
	Dump		-	RL20 and ROM	-
26/09/2018	Production	5500 (Digger)	BUTT E and Coal	-	-
		SK75 (Drill)	-	-	-
		SK50 (Drill)	-	-	-
	Dump		RL20 and ROM	-	-

Figure 1 Bloomfield Operating Locations

Source: Bloomfield Collieries Pty Ltd 2018

4.2 Results of Operator Attended Noise Monitoring

Operator attended noise measurements commenced during the evening on Tuesday 25 September 2018 and completed during the day on Wednesday 26 September 2018. All operator attended noise surveys were conducted using a Brüel & Kjær Type 2270 integrating sound level meter (serial number 2679354).

The results of operator attended noise measurements are given in **Table 4** to **Table 8**.

Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date and start time.
- Wind velocity (m/s) and Temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Bloomfield Colliery and are stated only when a contribution could be quantified.

Table 4 Location F, Lot 684 Black Hill Road, Black Hill

Period	Date/ Start time/Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (L_{Amax} – dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
Day	26/09/2018 10:14 17°C Calm	77	68	58	45	56	Road traffic 39-77 Aeroplane 46-55 Birdsong 48 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Evening	25/09/2018 19:04 11°C Calm	73	63	55	45	52	Road traffic 50-73 Insects 41-49 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Night	25/09/2018 22:59 10°C 0.5 m/s SE 0/8 Cloud Cover	62	58	52	41	48	Road traffic 40-62 Insects 33-40 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					

Table 5 Location G, Buchanan Road, Buchanan

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 μPa)					Description of Noise Emission, Typical Maximum Noise Levels (L_{Amax} – dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
Day	26/09/2018 11:17 17°C 1 m/s S	60	53	50	43	48	Road traffic 41-52 Birdsong 51-60 Wind in trees 33-51 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Evening	25/09/2018 19:59 12°C 1 m/s ESE	53	50	47	41	44	Insects 30-38 Road traffic 38-53 Wind in trees 39 **Bloomfield Colliery Audible** Haul trucks 38-47 Engine noise 32-35
		Estimated Bloomfield Colliery Noise Contribution 41 dBA $L_{Aeq(15minute)}$					
Night	26/09/2018 00:05 11°C 0.5 m/s SE 0/8 Cloud Cover	45	43	36	31	34	Road traffic 32-45 Insects 28-31 Livestock 37 **Bloomfield Colliery Audible** Engine noise 28-37 Reversing alarm 32
		Estimated Bloomfield Colliery Noise Contribution 31 dBA $L_{Aeq(15minute)}$ 37 $L_{A1(1minute)}$					

Table 6 Location L, 17 Kilshanny Ave, Ashtonfield

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 μPa)					Description of Noise Emission, Typical Maximum Noise Levels (L_{Amax} – dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
Day	26/09/2018 11:46 17°C 1 m/s SSE	71	62	50	42	50	Birdsong 42-63 Local traffic 62-71 Distant traffic 42-44 Wind in trees 42-51 **Bloomfield Colliery Audible** Haul trucks <35 (occasional)
		Estimated Bloomfield Colliery Noise Contribution <30 dBA $L_{Aeq(15minute)}$					
Evening	25/09/2018 20:29 12°C 1 m/s E	78	63	40	37	51	Insects 32-33 Residential noise 36-41 Traffic 36-78 **Bloomfield Colliery Audible** Engine noise <30
		Estimated Bloomfield Colliery Noise Contribution <30 dBA $L_{Aeq(15minute)}$					
Night	26/09/2018 00:34 11°C 0.5 m/s SE 0/8 Cloud Cover	51	46	44	33	40	Insects 30-32 Traffic 32-41 Train 41-48 Dog barking 45-51 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					

Table 7 Location M, John Renshaw Drive, Buttai

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 μPa)					Description of Noise Emission, Typical Maximum Noise Levels (LAmax – dBA)
		LAmax	LA1	LA10	LA90	LAeq	
Day	26/09/2018 10:34 17°C 1.5 m/s SSE	61	54	50	42	47	Road traffic 42-61 Birdsong 38-54 Wind in trees 38-42 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Evening	25/09/2018 19:11 13°C 1 m/s ESE	67	61	56	48	53	Traffic 43-62 Helicopter 67 Wind in trees 43-45 Insects/frogs 34-38 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Night	25/09/2018 23:20 11°C 0.5 m/s SE 0/8 Cloud Cover	63	59	53	38	49	Traffic 42-63 Insects 35-42 Birdsong 45 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					

Table 8 Location N, Lings Road, Buttai

Period	Date/ Start time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission, Typical Maximum Noise Levels (L_{Amax} – dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
Day	26/09/2018 10:53 16°C 1 m/s ENE	84	78	72	50	68	Road Traffic 59-84 Birdsong 45 Idling vehicle 50-53 Aeroplane 48 **Bloomfield Colliery Inaudible**
		Estimated Bloomfield Colliery Noise Contribution Inaudible					
Evening	25/09/2018 19:32 13°C 1 m/s ESE	83	77	65	46	64	Road traffic 63-83 Insects 39-46 **Bloomfield Colliery** Haul trucks 38-43
		Estimated Bloomfield Colliery Noise Contribution 34 dBA $L_{Aeq(15minute)}$					
Night	25/09/2018 23:41 11°C 0.5 m/s SE 0/8 Cloud Cover	79	74	62	38	60	Road traffic 65-79 Insects 30-34 **Bloomfield Colliery Barely Audible** Engine noise 28-33 Reversing alarm <25
		Estimated Bloomfield Colliery Noise Contribution 30 dBA $L_{Aeq(15minute)}$ 33 dBA $L_{A1(1minute)}$					

4.3 Operator Attended Noise Monitoring Summary

4.3.1 Location F – Black Hill Road, Black Hill

Noise levels at Location F, were dominated by local traffic on Black Hill Road and distant traffic on John Renshaw Drive. Insect noise and birdsong was also a contributor at this location.

Bloomfield Colliery operations remained inaudible at this location during all operator attended noise measurements.

4.3.2 Location G – Buchanan Road, Buchanan

Road traffic on Buchanan Road and John Renshaw Drive contributed to the overall ambient noise environment during the day, evening and night-time operator attended noise surveys at this location.

Bloomfield Colliery operations were inaudible during the daytime and audible during the evening and night-time noise monitoring surveys at this location and consisted of general mining and haul truck activity. Bloomfield $L_{Aeq(15minute)}$ noise contribution was estimated to be 41 dBA and 31 dBA respectively during the evening and night-time monitoring surveys. During the night-time haul truck activity generated a $L_{A1(1minute)}$ noise level of 37 dBA.

4.3.3 Location L – Killshanny Avenue, Ashtonfield

Noise levels at Location L were dominated by intermittent road traffic, suburban noise as well as insects and birds.

Bloomfield Colliery operations were audible during the daytime and evening period at this location and consisted of haul truck movements and general mining operations. Bloomfield $L_{Aeq(15minute)}$ noise contribution was estimated to be <30 dBA during the day and evening and monitoring surveys.

4.3.4 Location M – John Renshaw Drive, Buttai

Noise levels at Location M, were dominated by distant traffic on John Renshaw Drive as well as insects and birds.

Bloomfield Colliery operations remained inaudible at this location during all operator attended noise measurements.

4.3.5 Location N – Lings Road, Buttai

Noise levels at location N were dominated by traffic noise from John Renshaw Drive and insects.

Bloomfield Colliery operations were audible at this location during the evening and night-time operator attended noise surveys. Bloomfield $L_{Aeq(15minute)}$ noise contribution was estimated to be 34 dBA and 30 dBA respectively during the evening and night-time monitoring surveys. During the night-time haul truck activity generated a $L_{A1(1minute)}$ noise level of 33 dBA.

4.4 Compliance Assessment and Discussion of Results

4.4.1 Operations

Results of the operational noise compliance assessment are given in **Table 9**.

Table 9 Compliance Noise Assessment – Operations

Location	Estimated Bloomfield **$L_{Aeq(15minute)}$** – Contribution dBA			Consent Conditions **$L_{Aeq(15minute)}$** dBA			Compliance		
	Day	**Eve**	**Night**	**Day**	**Eve**	**Night**	**Day**	**Eve**	**Night**
F – Black Hill Road, Black Hill[1]	I/A[2]	I/A[2]	I/A[2]	35	35	35	Yes	Yes	Yes
G – Buchanan Road, Buchanan	I/A[2]	41	31	39	42	37	Yes	Yes	Yes
L – Kilshanny Ave, Ashtonfield	<30	<30	I/A	35	35	35	Yes	Yes	Yes
M – John Renshaw Drive, Buttai	I/A[2]	I/A[2]	I/A[2]	39	39	37	Yes	Yes	Yes
N – Lings Road, Buttai	I/A[2]	34	30	42	42	35	Yes	Yes	Yes

1. Mine-owned property
2. I/A = Inaudible

4.4.2 Sleep Disturbance

Results of the sleep disturbance compliance assessment are given in **Table 10**.

Table 10 Compliance Noise Assessment – Sleep Disturbance

Location	Estimated Bloomfield $L_{A1(1minute)}$ Contribution dBA	Consent Conditions $L_{A1(1minute)}$ dBA	Compliance
F – Black Hill Road, Black Hill[1]	I/A[2]	45	Yes
G – Buchanan Road, Buchanan	37	45	Yes
L – Kilshanny Ave, Ashtonfield	I/A[2]	45	Yes
M – John Renshaw Drive, Buttai	I/A[2]	46	Yes
N – Lings Road, Buttai	33	46	Yes

1. Mine-owned property
2. I/A = Inaudible

Results presented in **Table 10** indicate that compliance with the sleep disturbance consent conditions was achieved at all locations during the night-time noise surveys.

5 Unattended Continuous Noise Monitoring

5.1 Results of Unattended Continuous Monitoring

Unattended continuous noise monitoring was conducted between Thursday 20 September 2018 and Sunday 30 September 2018 at each of the five nominated locations given in **Table 2**.

Details of the noise loggers used for the unattended continuous noise monitoring are given in **Table 11**.

As Location N is predominately dominated by road traffic along John Renshaw Drive, an alternate noise logger location was selected closer to Bloomfield operations. The alternative logger location allows a Bloomfield noise contribution to be measured at this location and a Bloomfield contribution to be calculated at Location N.

Table 11 Noise Logger and Noise Monitoring Location

Location	Noise Logger Serial Number	Date of Logging
F – Black Hill Road, Black Hill	ARL EL-316 16-207-050	20 September 2018 - 30 September 2018
G – Buchanan Road, Buchanan	ARL EL-316 16-306-041	20 September 2018 - 30 September 2018
L – Kilshanny Ave, Kilshanny	ARL EL-316 16-203-525	20 September 2018 - 30 September 2018
M – John Renshaw Drive, Buttai	ARL EL-316 16-306-039	20 September 2018 - 30 September 2018
N – Alternative Logger Location 669 John Renshaw Drive, Buttai	ARL EL-316 16-306-040	20 September 2018 - 30 September 2018

The unattended ambient noise logger data from each monitoring location have been presented graphically on a daily basis and are attached as **Appendix C**. A summary of the results of the unattended continuous noise monitoring is given in **Table 12**.

The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the NSW *Noise Policy for Industry* (NPfI).

Precautions were taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data for the subject area during the noise monitoring period was obtained from the weather station located on the Bloomfield project site. Noise data during periods of any rainfall and/or wind speeds in excess of 5 m/s (approximately 9 knots) were discarded in accordance with NPfI weather affected data exclusion methodology.

Table 12 Unattended Continuous Monitoring Ambient Noise Levels (dBA)

Location	Period	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}
F – Black Hill Road, Black Hill	Day	71	57	45	59
	Evening	63	55	47	55
	Night	59	53	39	53
G -156 Buchanan Road, Buchanan	Daytime	54	49	39	48
	Evening	49	46	36	44
	Night	47	43	29	43
L – Kilshanny Avenue, Ashtonfield	Daytime	62	51	31	52
	Evening	58	44	36	48
	Night	47	37	26	46
M - John Renshaw Drive, Buttai	Daytime	55	50	41	50
	Evening	53	49	39	48
	Night	53	47	31	49
N – Alternative Logger Location 669 John Renshaw Drive	Daytime	57	51	37	51
	Evening	60	54	36	54
	Night	49	45	30	51

5.2 Discussion

Noise levels at Location G, Location F and Location M were dominated by road traffic as well as insects, while at Location L noise levels were dominated by insects, local traffic and residential noise.

A review of data from the noise logger at the alternative logger location N reveals that noise levels at this location are heavily influenced by Bloomfield operations generating typical $L_{Aeq(15minute)}$ noise levels in the order of 55 dBA to 60 dBA during the day, evening and night operator attended noise monitoring periods. Taking into account operating locations, distance and barrier attenuation from the pit wall, likely noise levels at Location N were calculated to be between 26 dBA to 31 dBA and therefore further indicate compliance with the consent conditions at Location N during the noise monitoring period.

6 Conclusion

SLR was engaged by Bloomfield Collieries Pty Ltd to conduct operator attended and unattended noise monitoring for Bloomfield Colliery in accordance with the Project Approval requirements.

Results of noise monitoring have indicated compliance with the consent conditions at all monitoring locations during the September 2018 monitoring period.

1 Sound Level or Noise Level

The terms "sound" and "noise" are almost interchangeable, except that in common usage "noise" is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or L_P are commonly used to represent Sound Pressure Level. The symbol L_A represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2E-5 Pa.

2 "A" Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an "A-weighting" filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the loudness of that sound. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120 110	Heavy rock concert Grinding on steel	Extremely noisy
100 90	Loud car horn at 3 m Construction site with pneumatic hammering	Very noisy
80 70	Kerbside of busy street Loud radio or television	Loud
60 50	Department store General Office	Moderate to quiet
40 30	Inside private office Inside bedroom	Quiet to very quiet
20	Unoccupied recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as "linear", and the units are expressed as dB(Z) or dB.

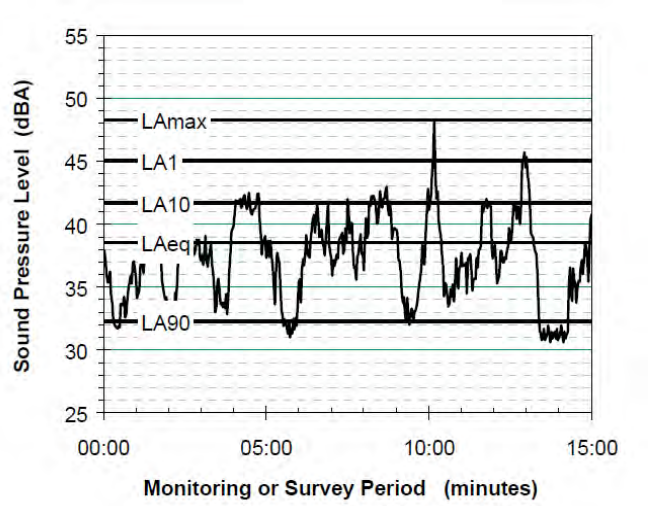
3 Sound Power Level

The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 1E-12 W.
The relationship between Sound Power and Sound Pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceed for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

L_{Aeq} The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the "repeatable minimum" L_{A90} noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or "average" levels representative of the other descriptors (L_{Aeq}, L_{A10}, etc).

5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally regarded as more offensive than "broad band" noise.

6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

7 Frequency Analysis

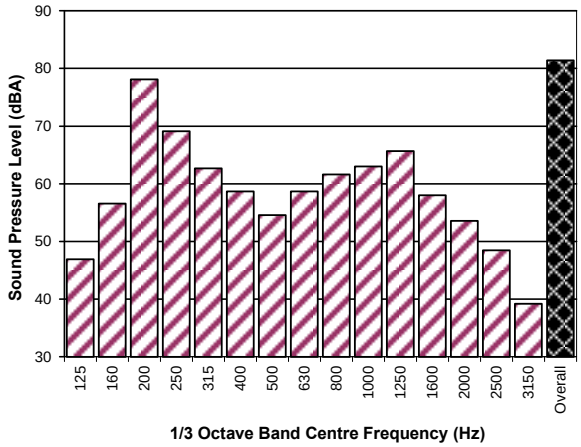
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using Fast Fourier Transform (FFT) analysers.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



8 Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of "peak" velocity or "rms" velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as "peak particle velocity", or PPV. The latter incorporates "root mean squared" averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements. Where triaxial measurements are used, the axes are commonly designated vertical, longitudinal (aligned toward the source) and transverse.

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/V_o), where V_o is the reference level (1E-6 mm/s). Care is required in this regard, as other reference levels are used by some organizations.

9 Human Perception of Vibration

People are able to "feel" vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as "normal" in a car, bus or train is considerably higher than what is perceived as "normal" in a shop, office or dwelling.

10 Over-Pressure

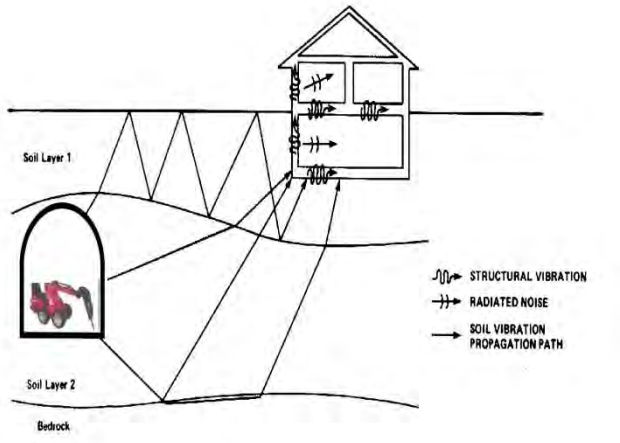
The term "over-pressure" is used to describe the air pressure pulse emitted during blasting or similar events. The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.

11 Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed "regenerated noise", "structure-borne noise", or sometimes "ground-borne noise". Regenerated noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of regenerated noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents the various paths by which vibration and regenerated noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term "regenerated noise" is also used to describe other types of noise that are emitted from the primary source as a different form of energy. One example would be a fan with a silencer, where the fan is the energy source and primary noise source. The silencer may effectively reduce the fan noise, but some additional noise may be created by the aerodynamic effect of the silencer in the airstream. This "secondary" noise may be referred to as regenerated noise.

Appendix B

Noise Monitoring Location Map

SLR
10 KINGS ROAD
NEW LAMBTON
NEW SOUTH WALES 2305
AUSTRALIA
T: 61 2 4037 3200
F: 61 2 4037 3201
www.slrconsulting.com

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Project No.:	630.01053
Date:	28/01/2015
Drawn by:	NT
Scale:	1:45,000
Sheet Size:	A4
Projection:	GDA 1994 MGA Zone 56

LEGEND

Noise Monitoring Locations

N
W
E
S
0 500 1,000 1,500 2,000 m

Donaldson Coal

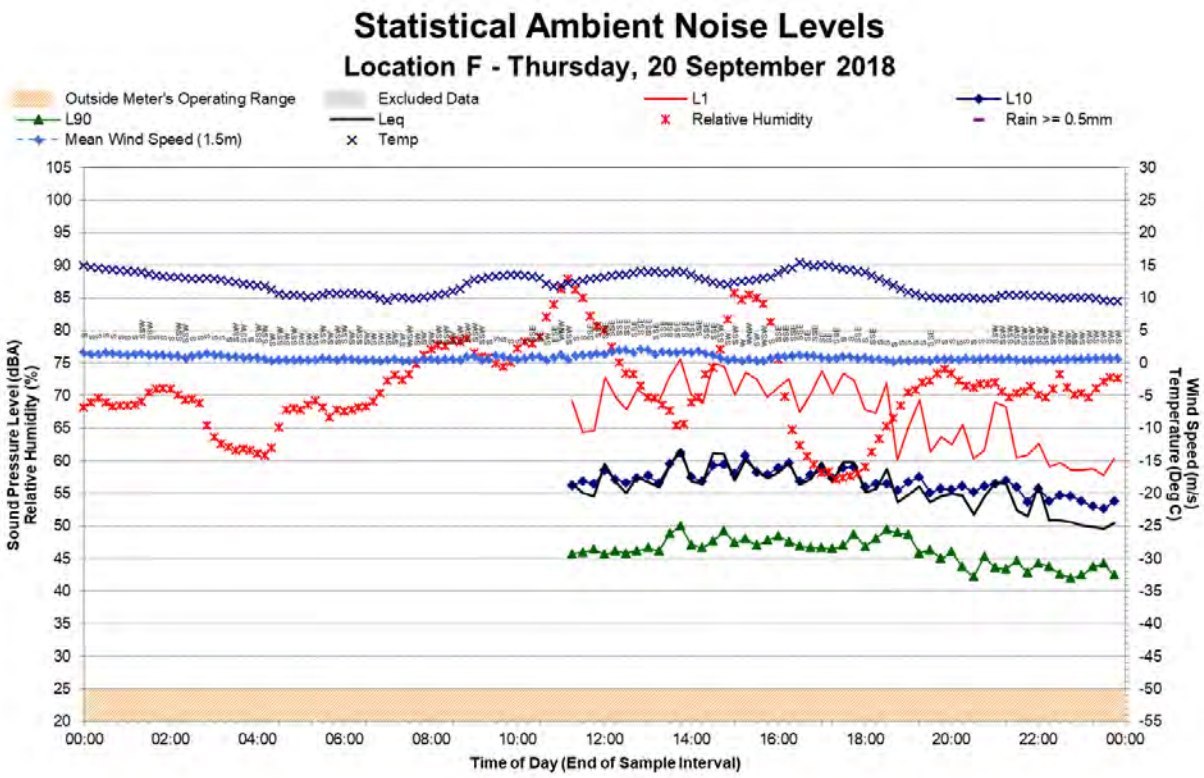
Noise Monitoring

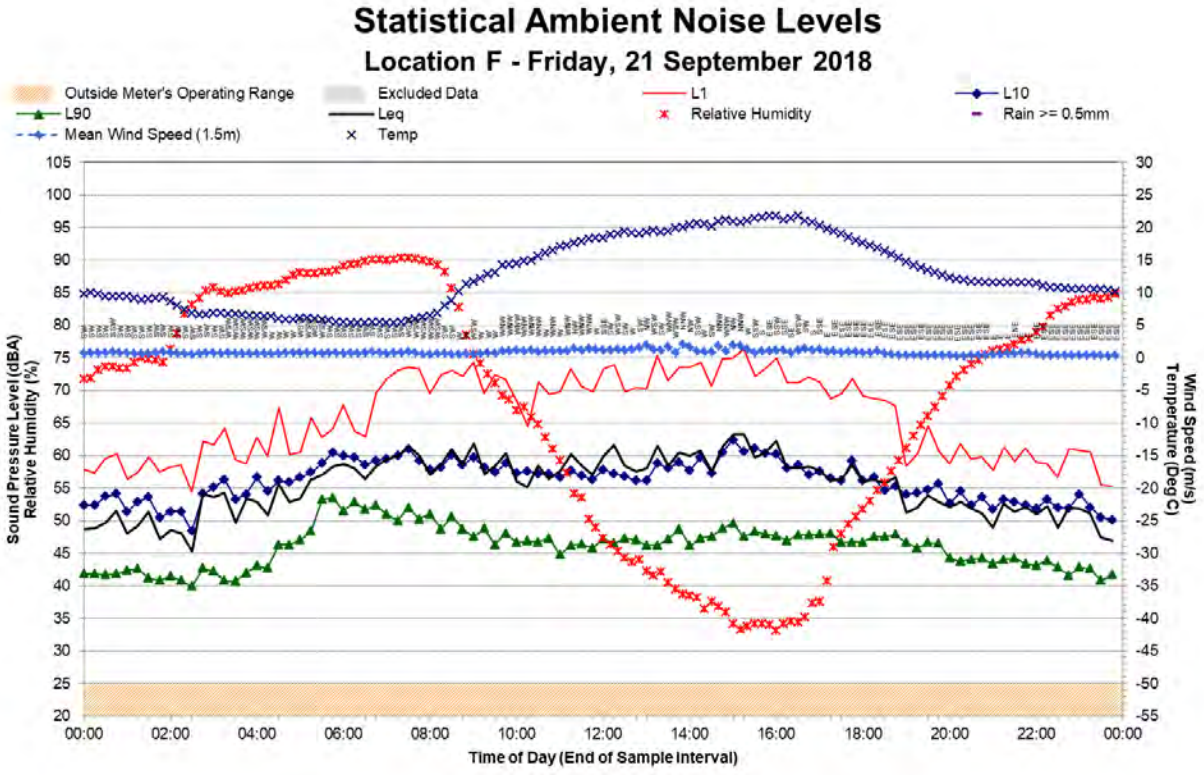
Noise Monitoring Locations

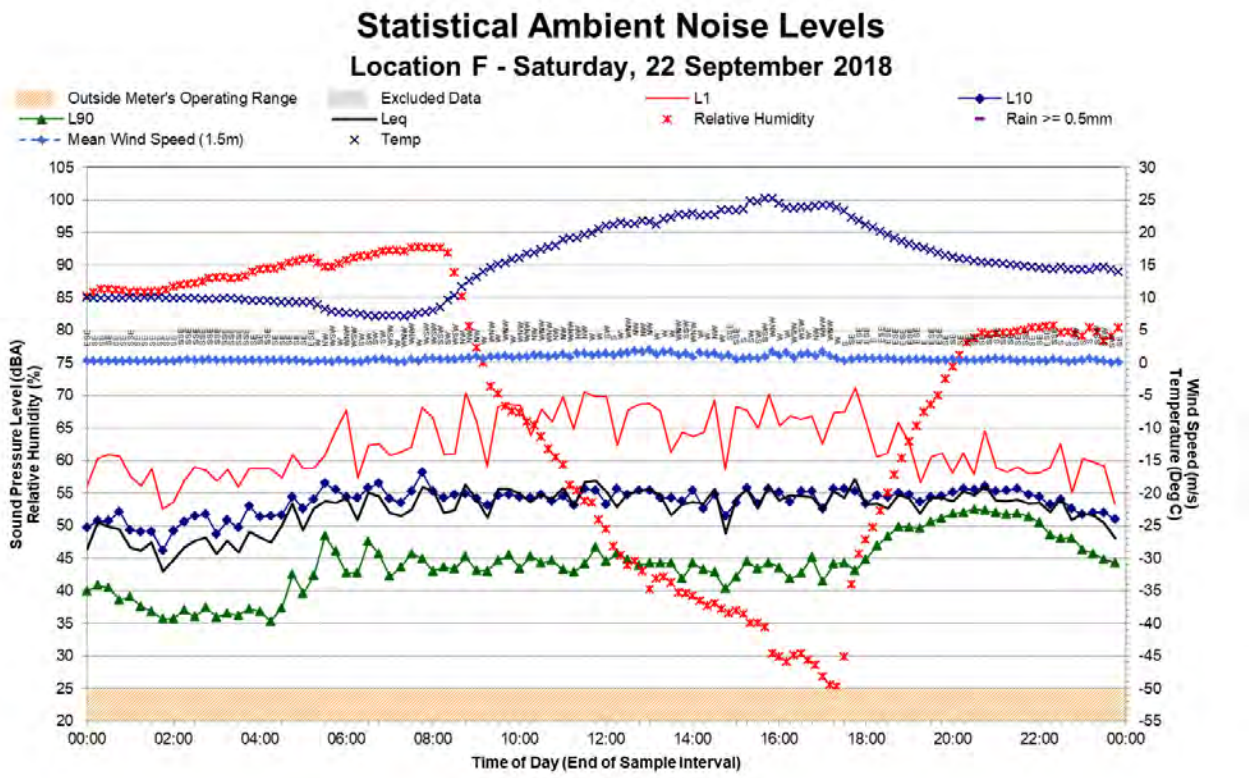
APPENDIX A

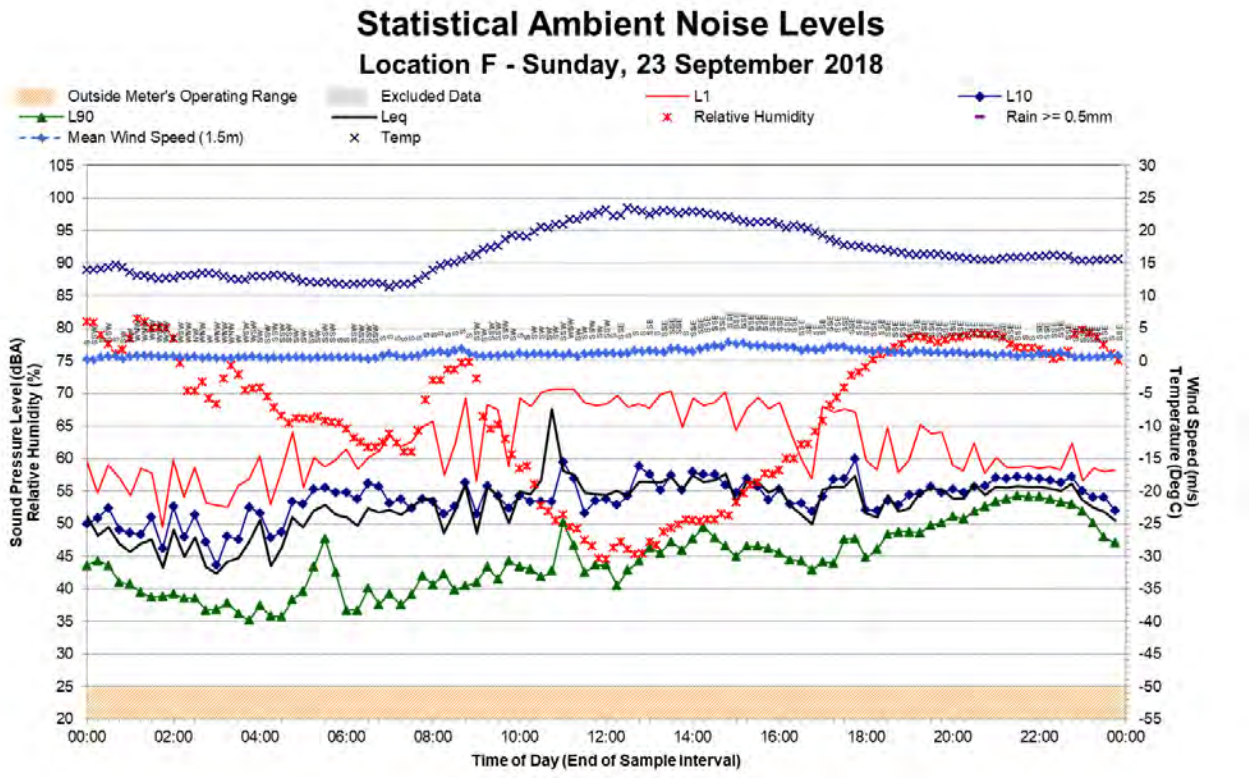
APPENDIX C

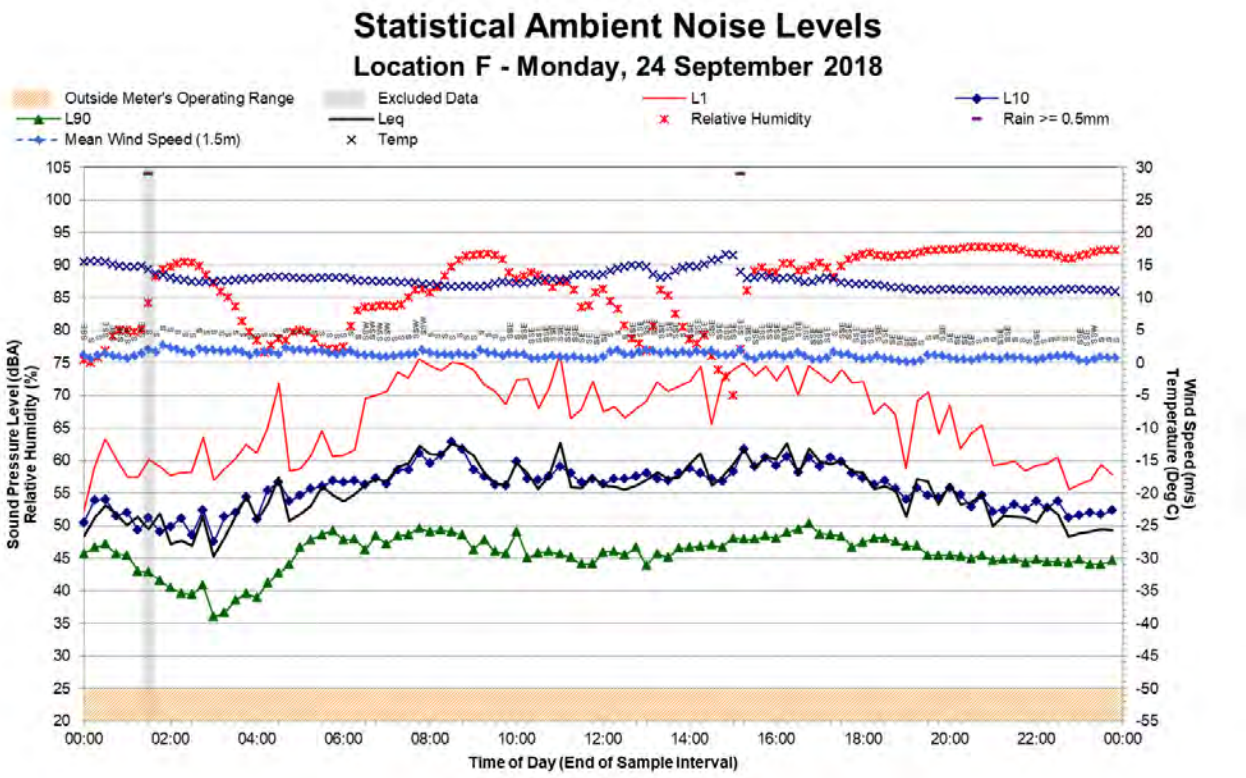
Statistical Ambient Noise Levels


Statistical Ambient Noise Levels
Location F - Thursday, 20 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Friday, 21 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Saturday, 22 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Sunday, 23 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Monday, 24 September 2018
Outside Meter's Operating Range
Excluded Data
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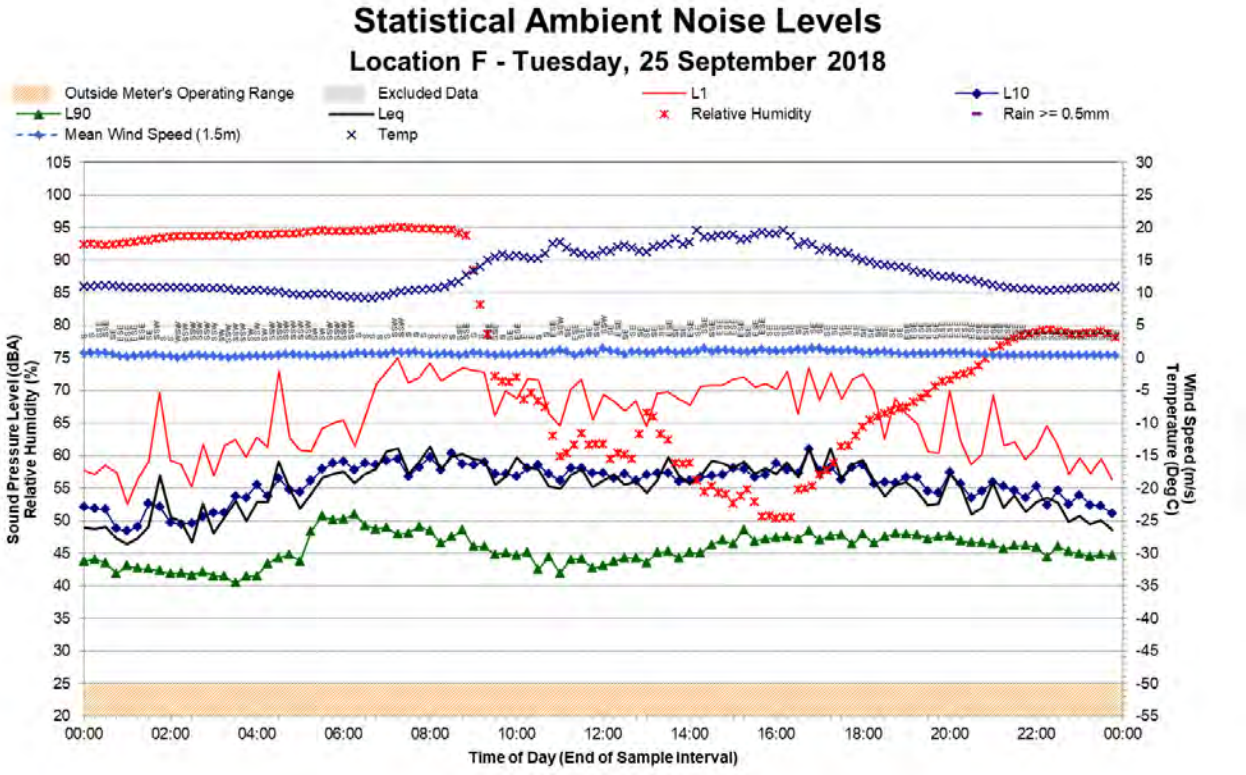
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Tuesday, 25 September 2018
Outside Meter's Operating Range
Excluded Data
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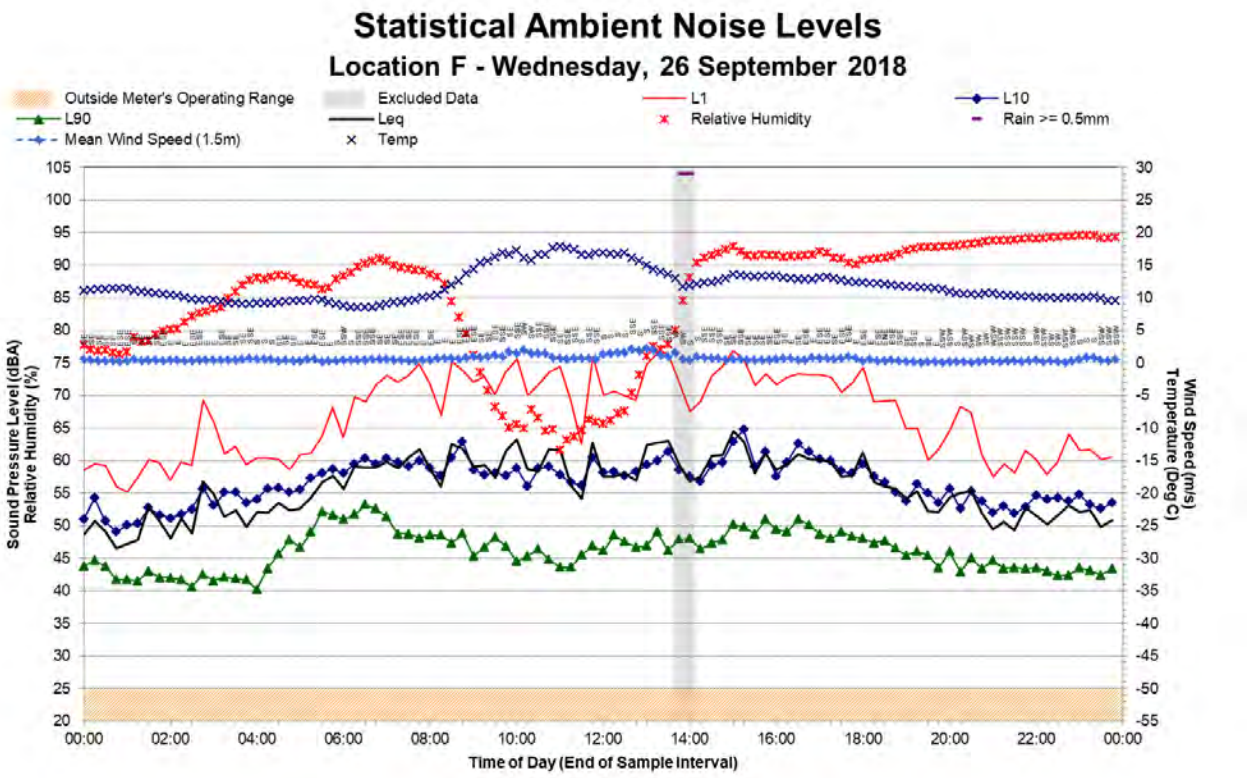
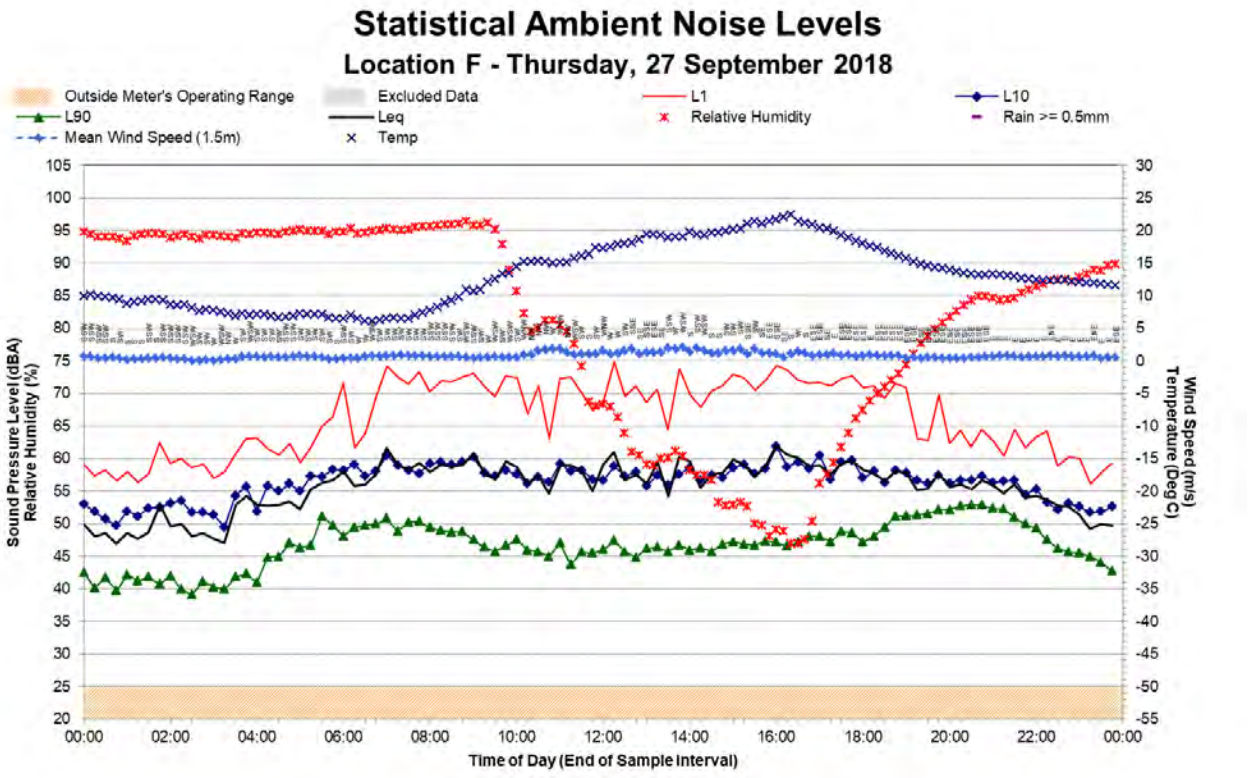
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Wednesday, 26 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Thursday, 27 September 2018
Outside Meter's Operating Range
Excluded Data
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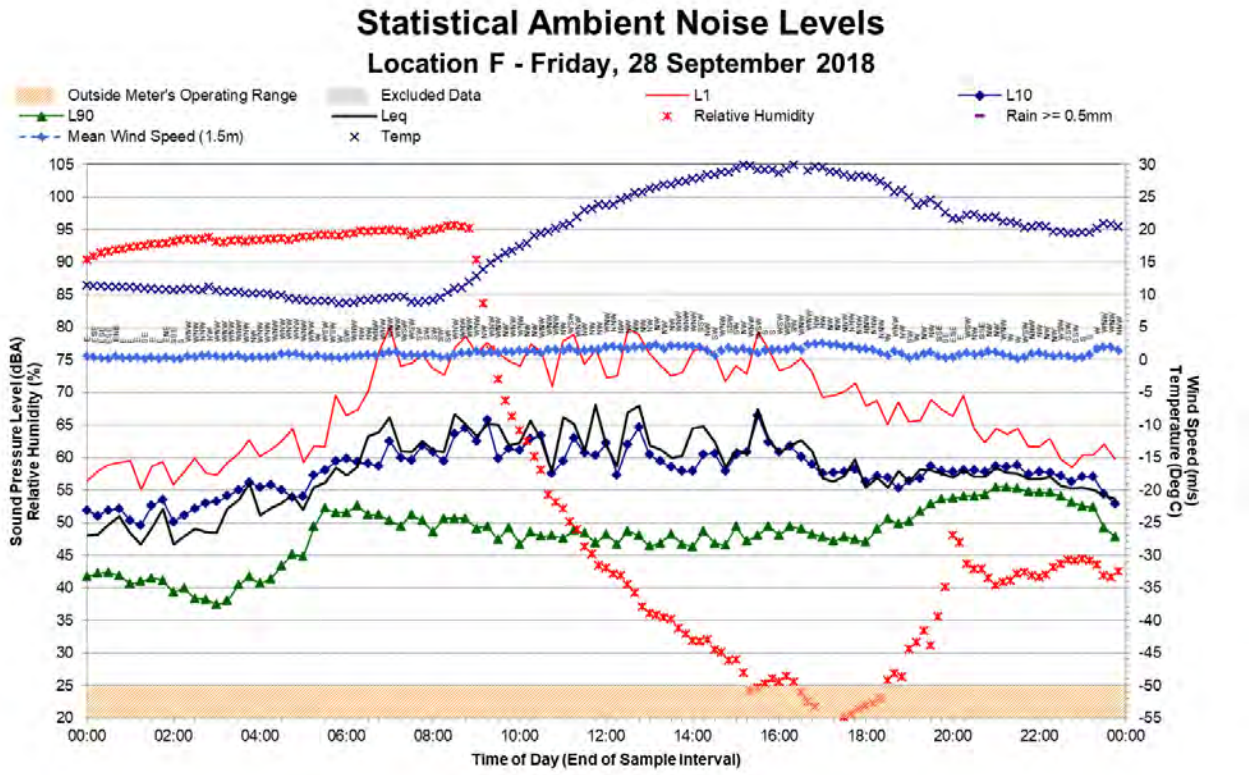
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Friday, 28 September 2018
Outside Meter's Operating Range
Excluded Data
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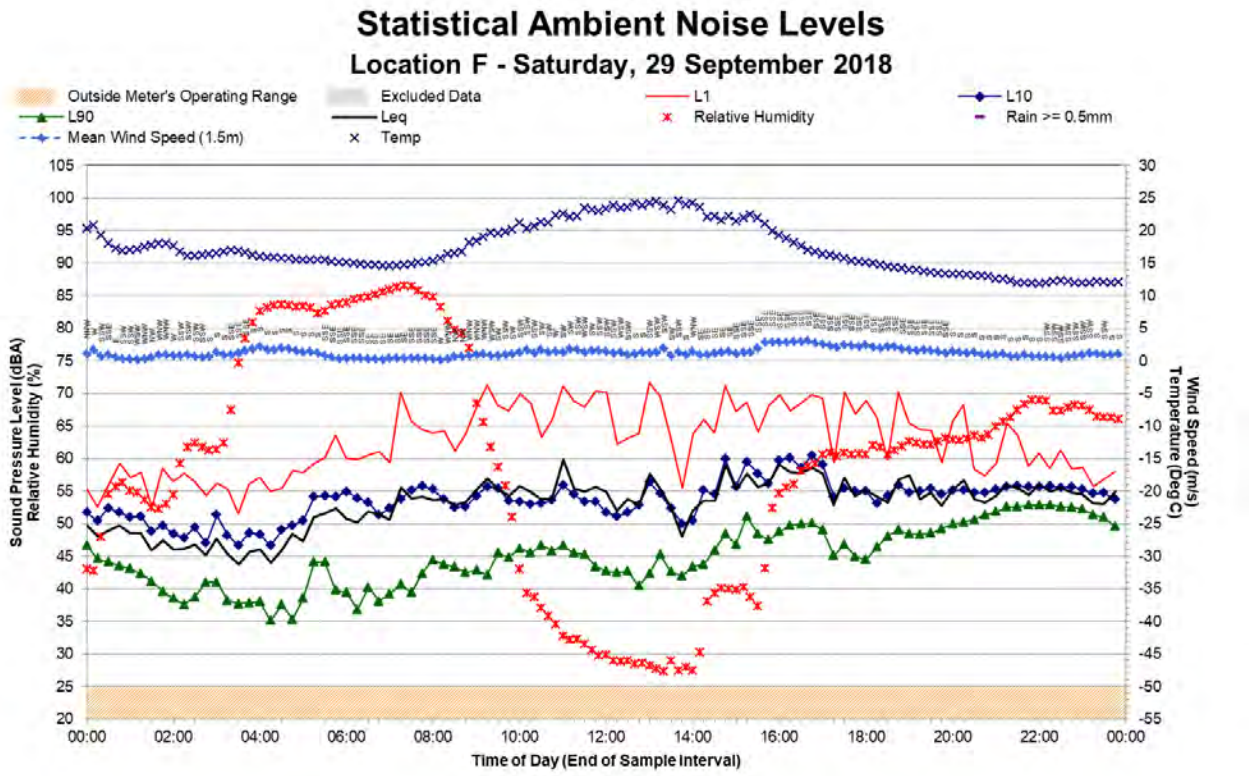
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location F - Saturday, 29 September 2018
Outside Meter's Operating Range
Excluded Data
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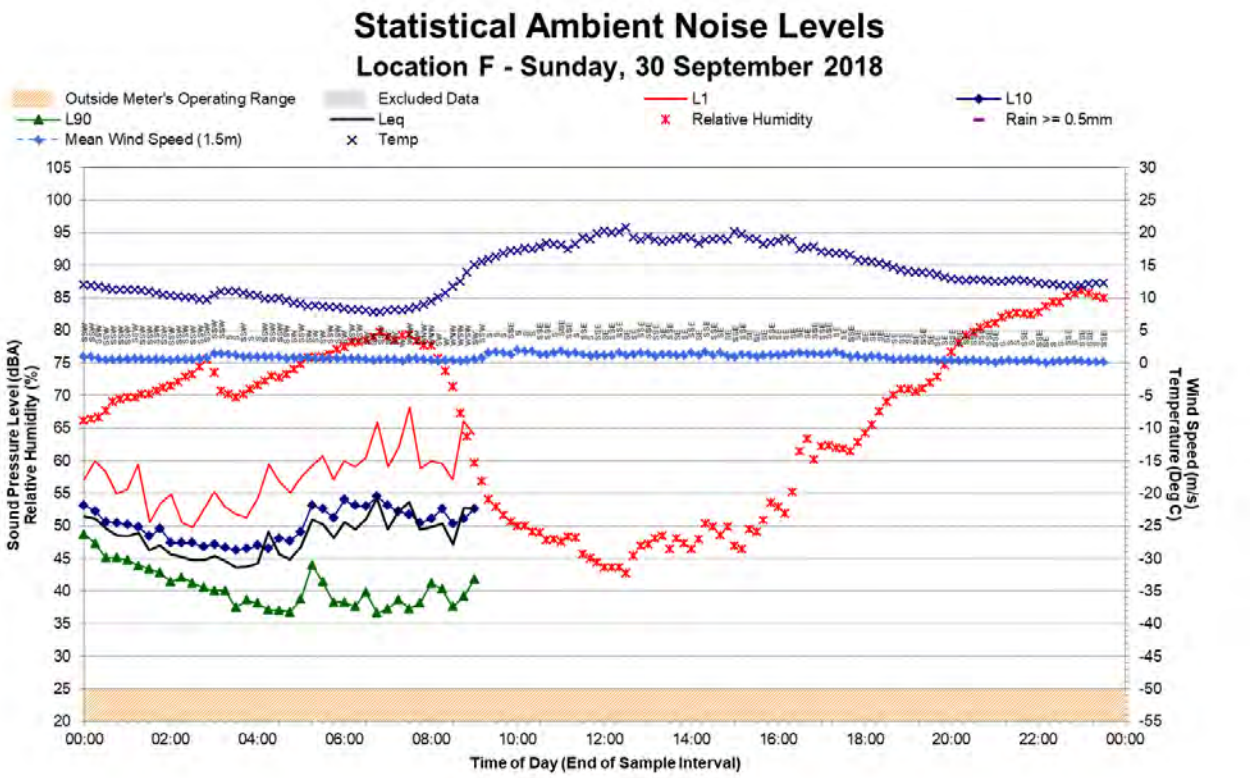
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Outside Meter's Operating Range
Excluded Data
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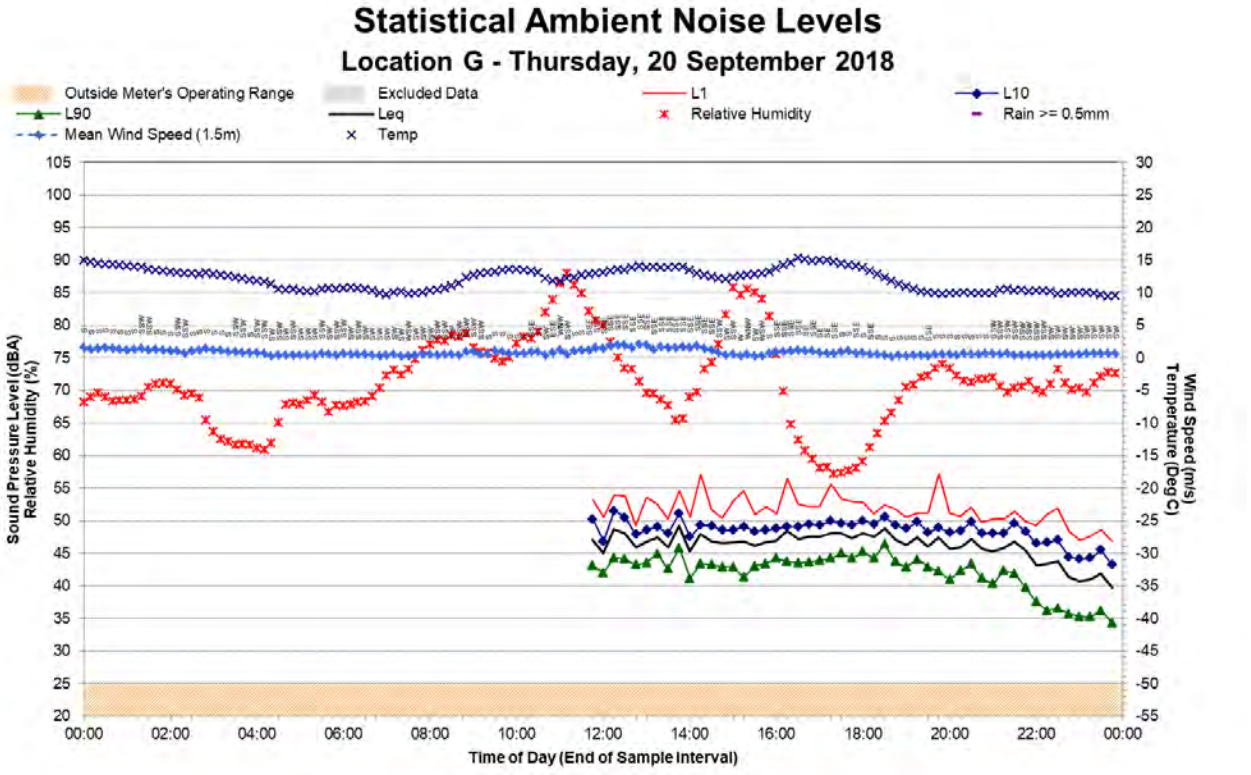
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
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Outside Meter's Operating Range
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L90
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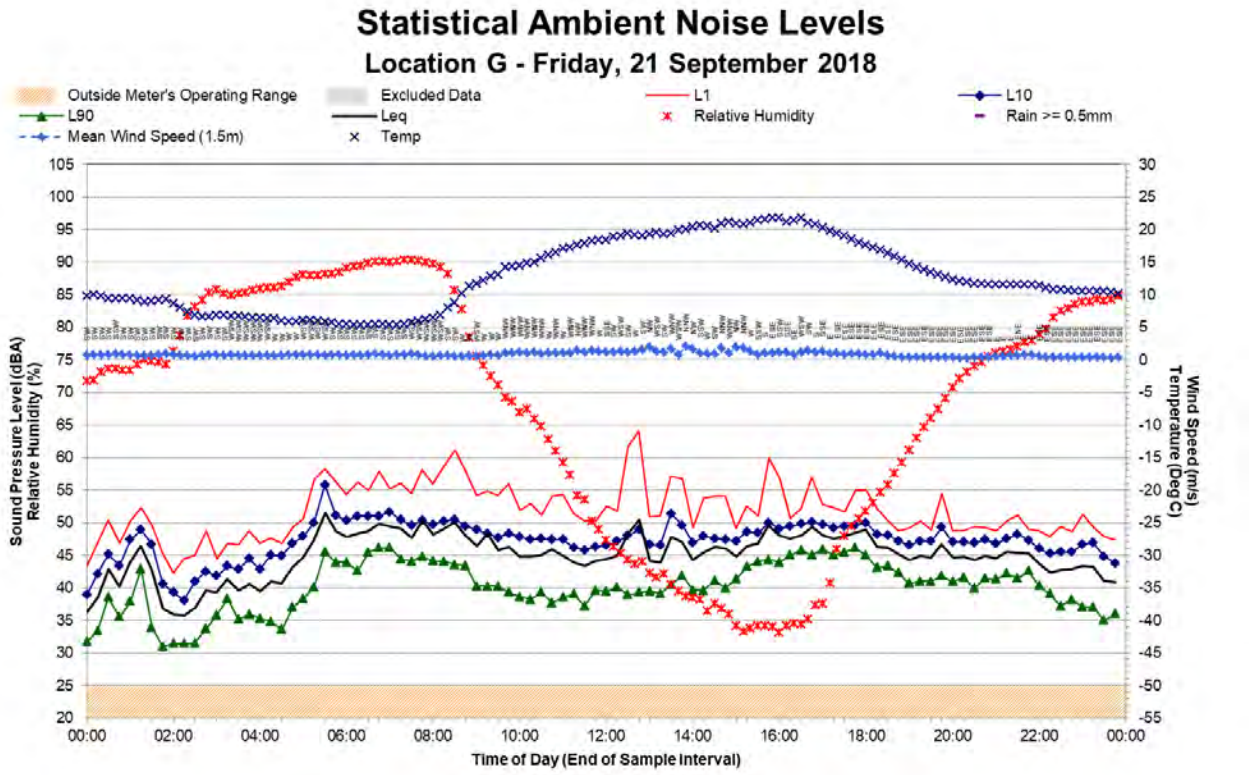
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location G - Friday, 21 September 2018
Outside Meter's Operating Range
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L90
Leq
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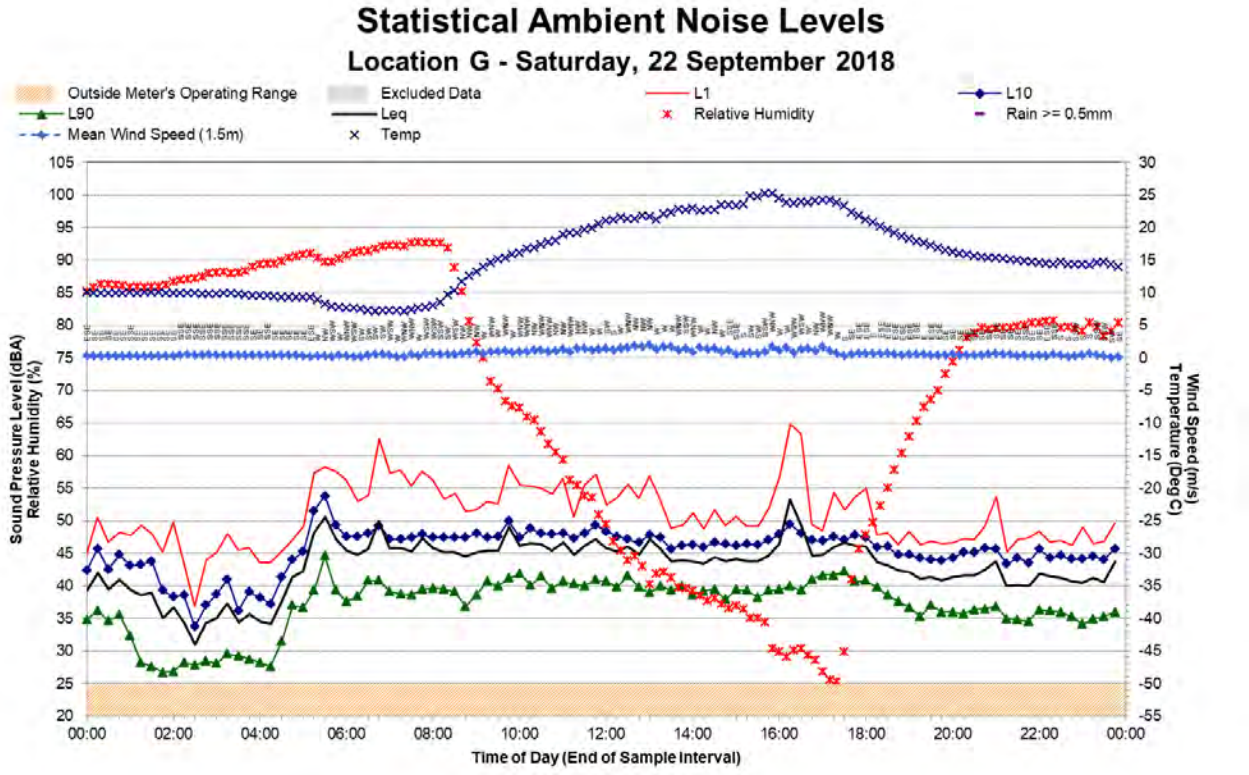
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Outside Meter's Operating Range
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Rain >= 0.5mm
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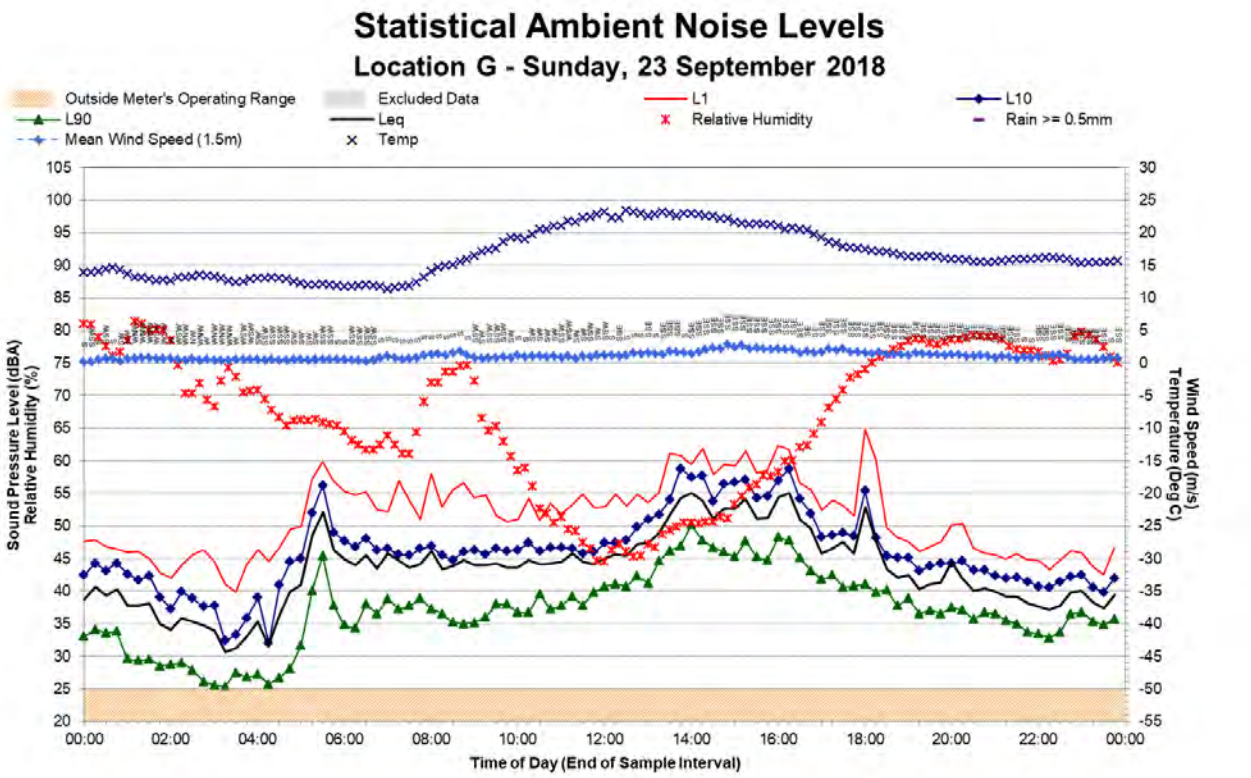
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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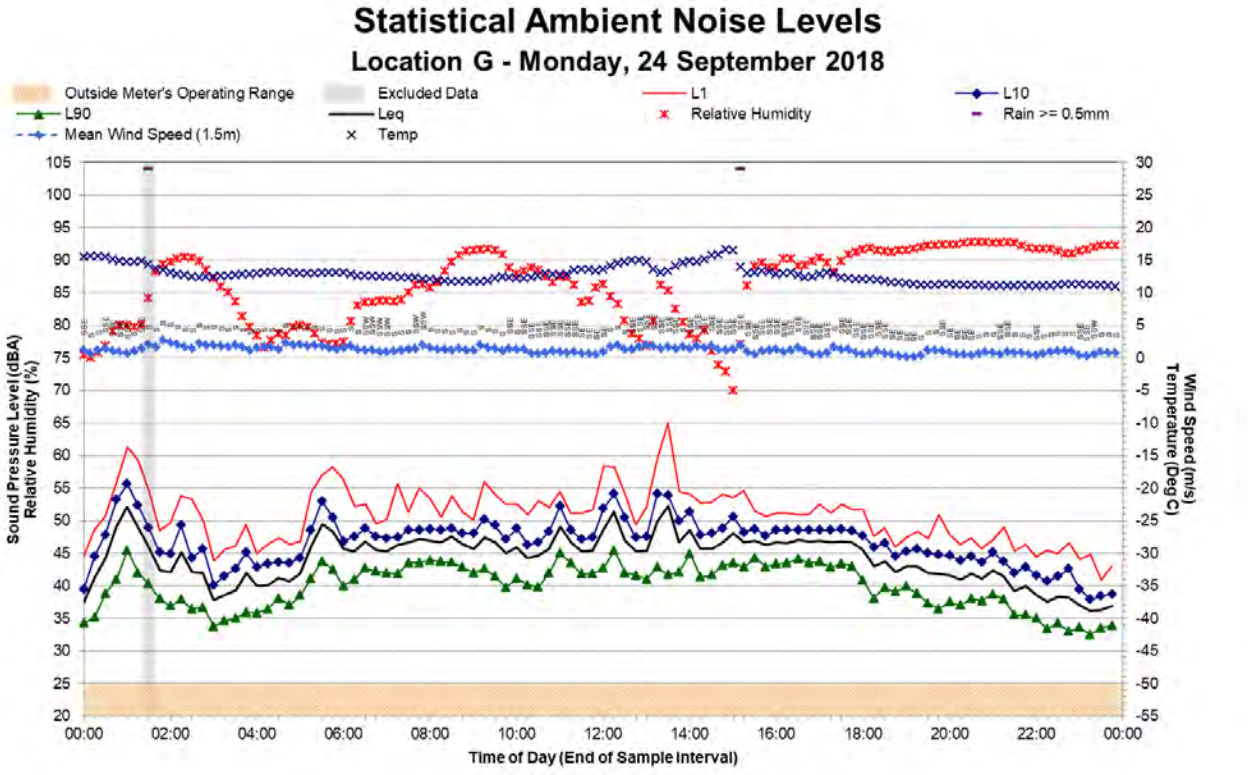
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Location G - Monday, 24 September 2018
Outside Meter's Operating Range
Excluded Data
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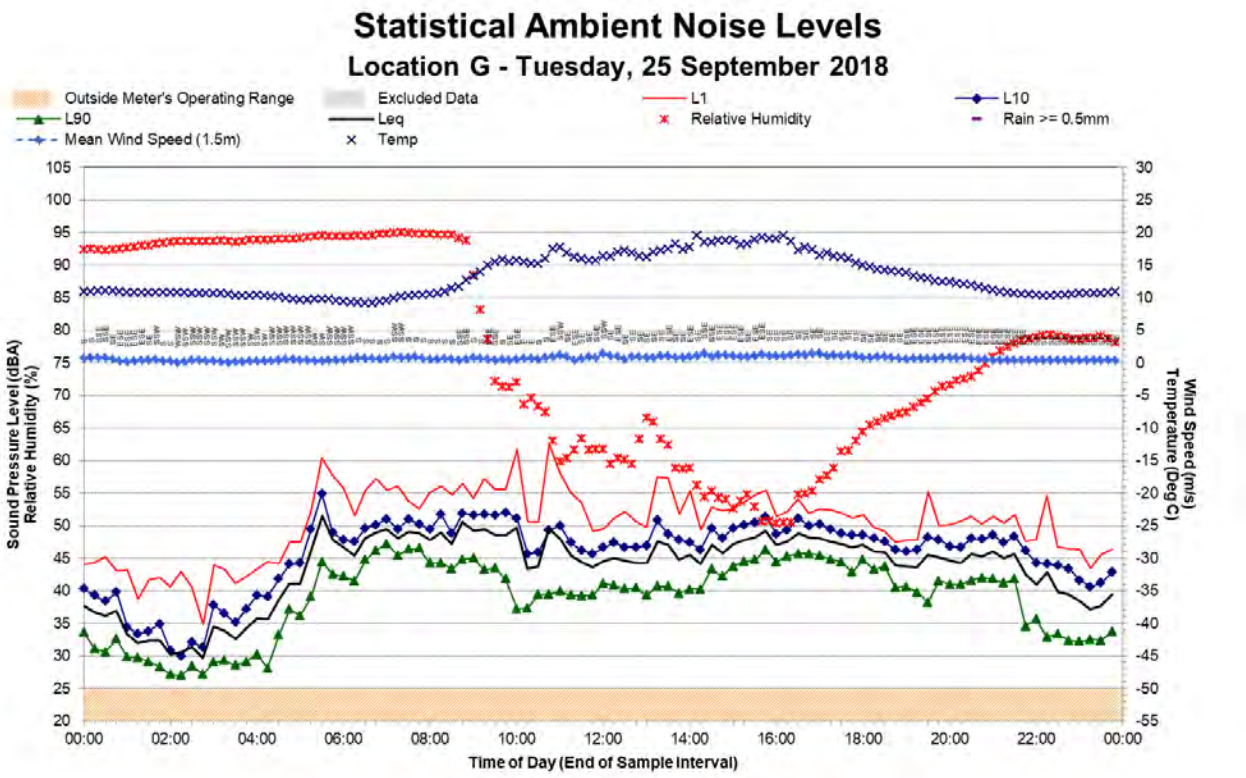
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Location G - Tuesday, 25 September 2018
Outside Meter's Operating Range
Excluded Data
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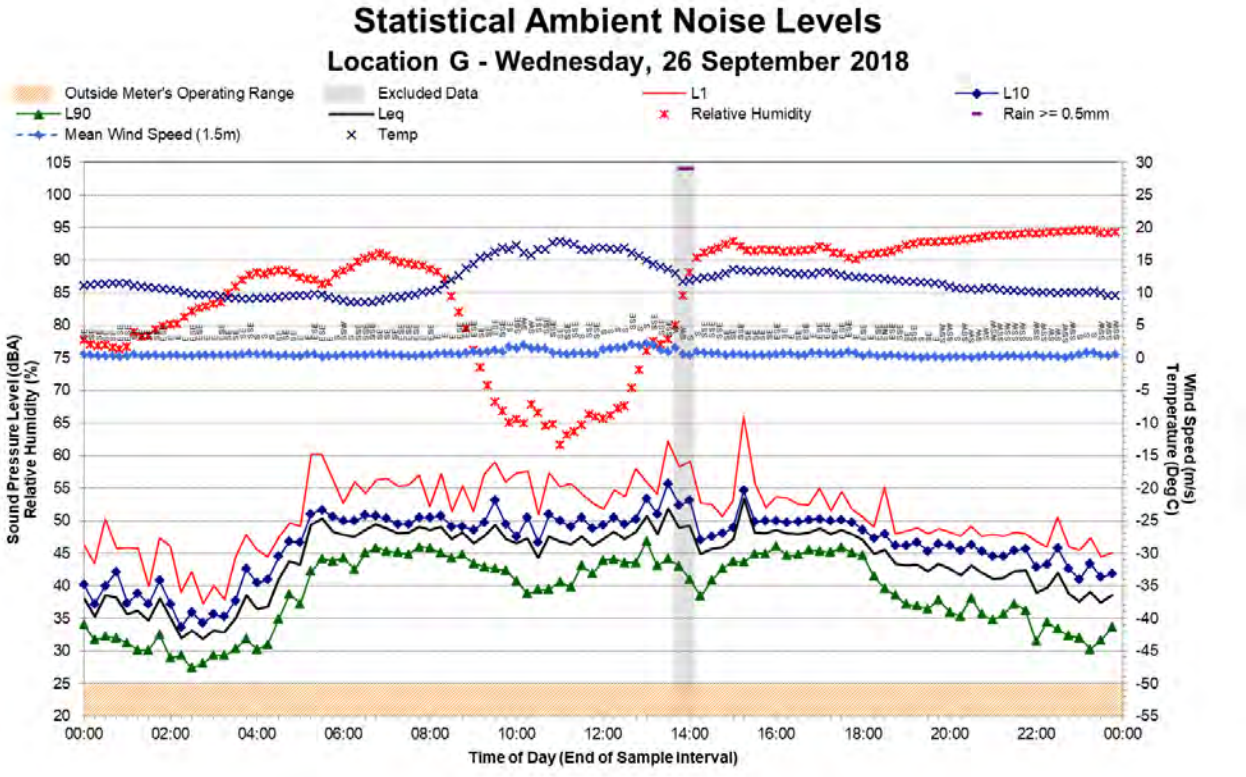
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location G - Wednesday, 26 September 2018
Outside Meter's Operating Range
Excluded Data
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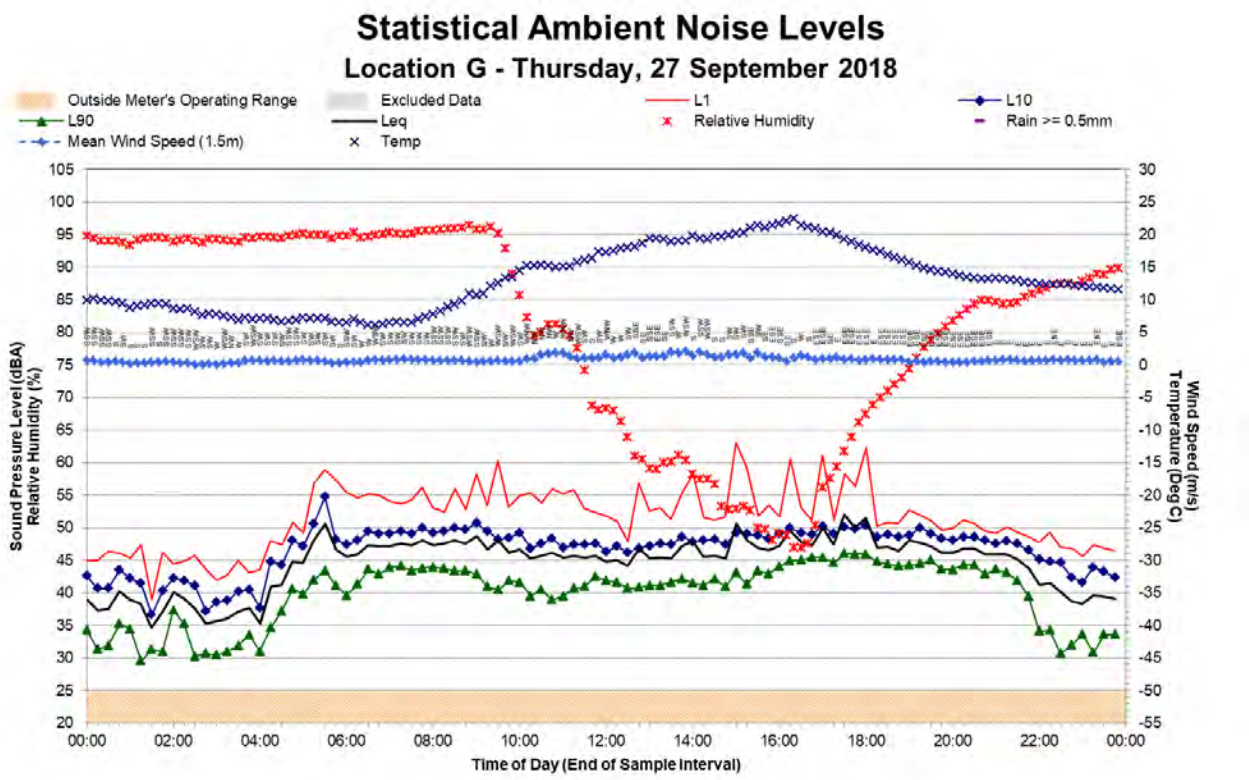
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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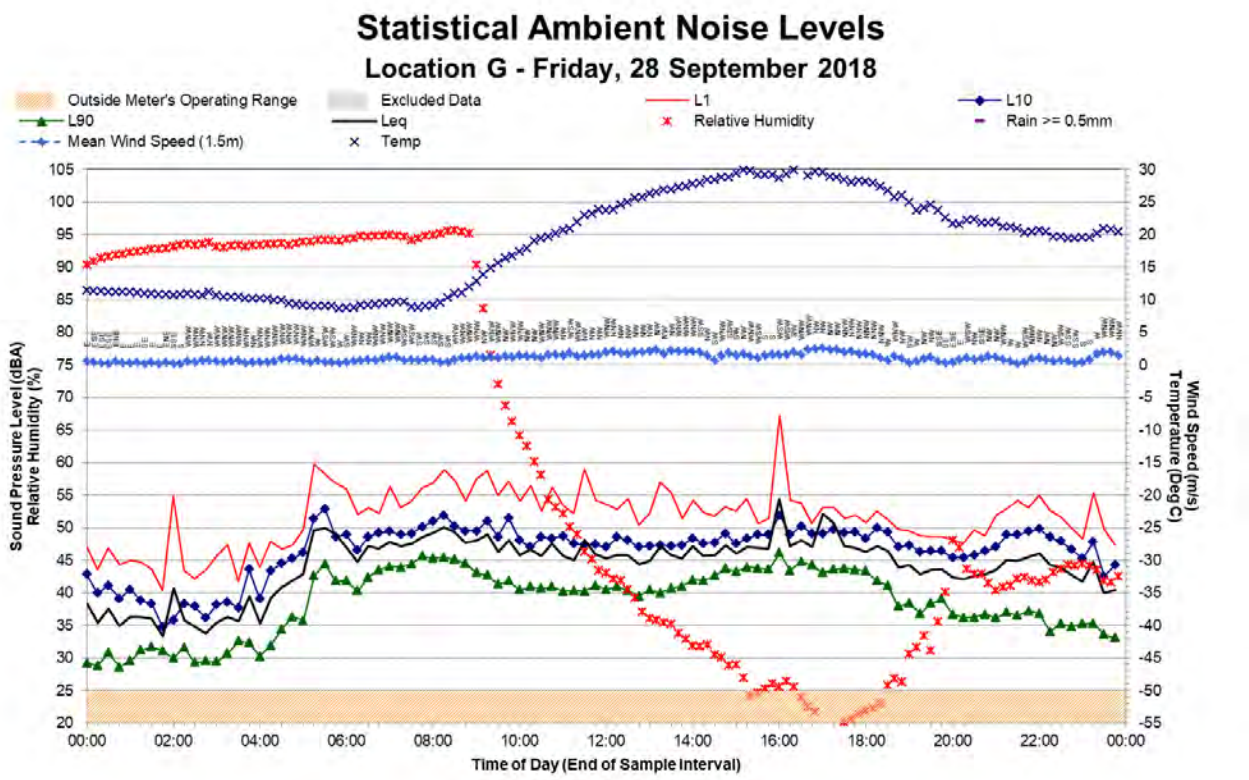
Location G - Thursday, 27 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Outside Meter's Operating Range
Excluded Data
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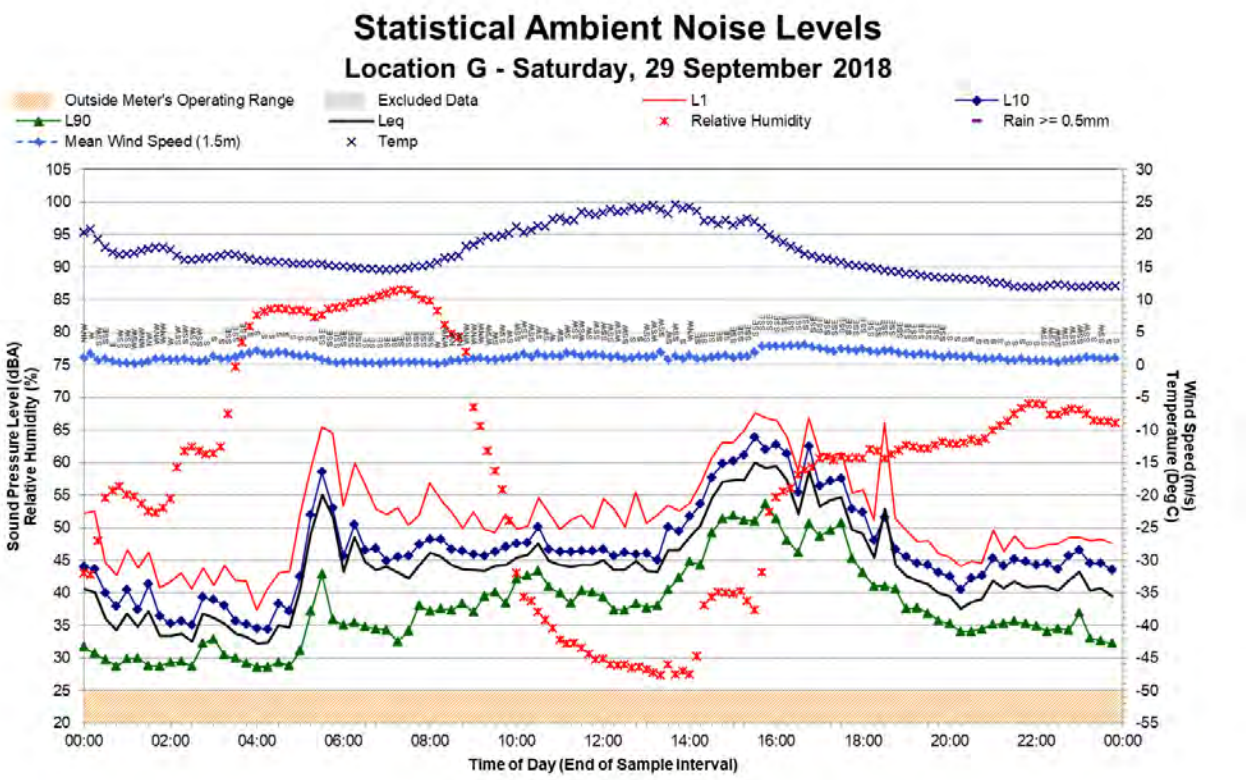
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location G - Saturday, 29 September 2018
Outside Meter's Operating Range
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Leq
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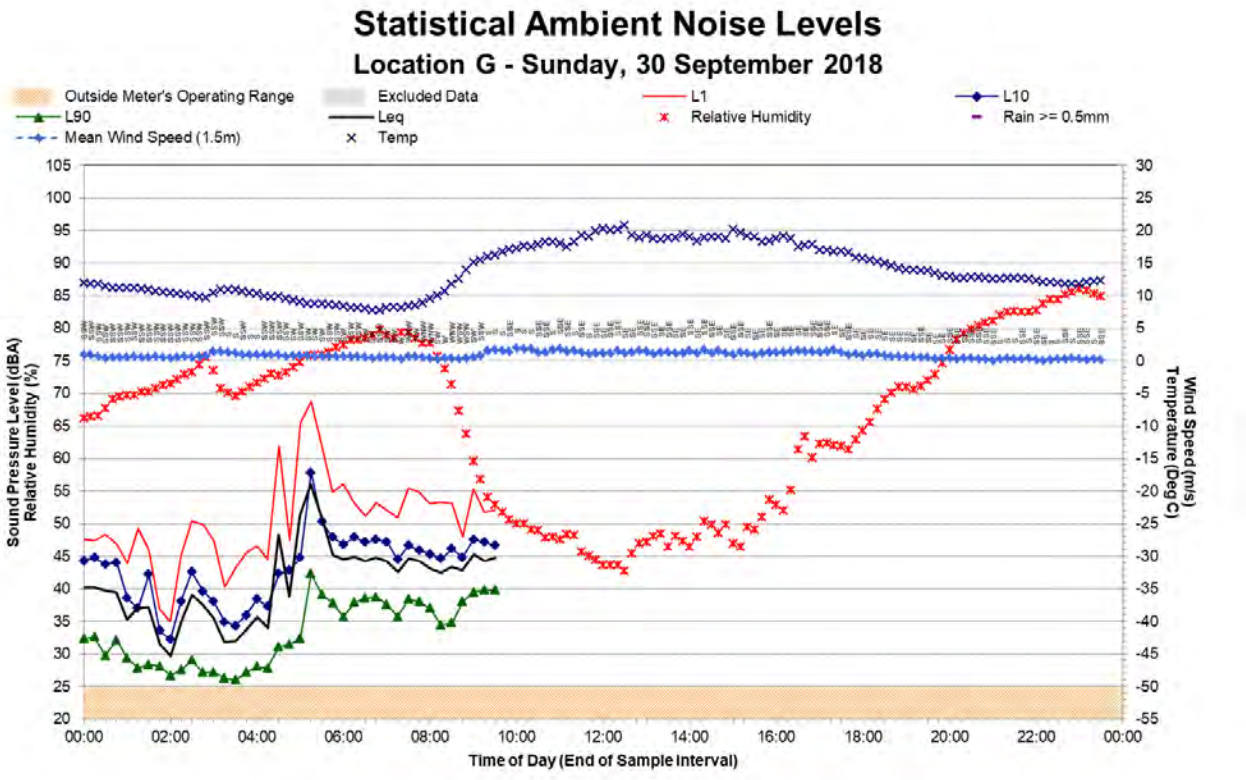
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Outside Meter's Operating Range
Excluded Data
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Leq
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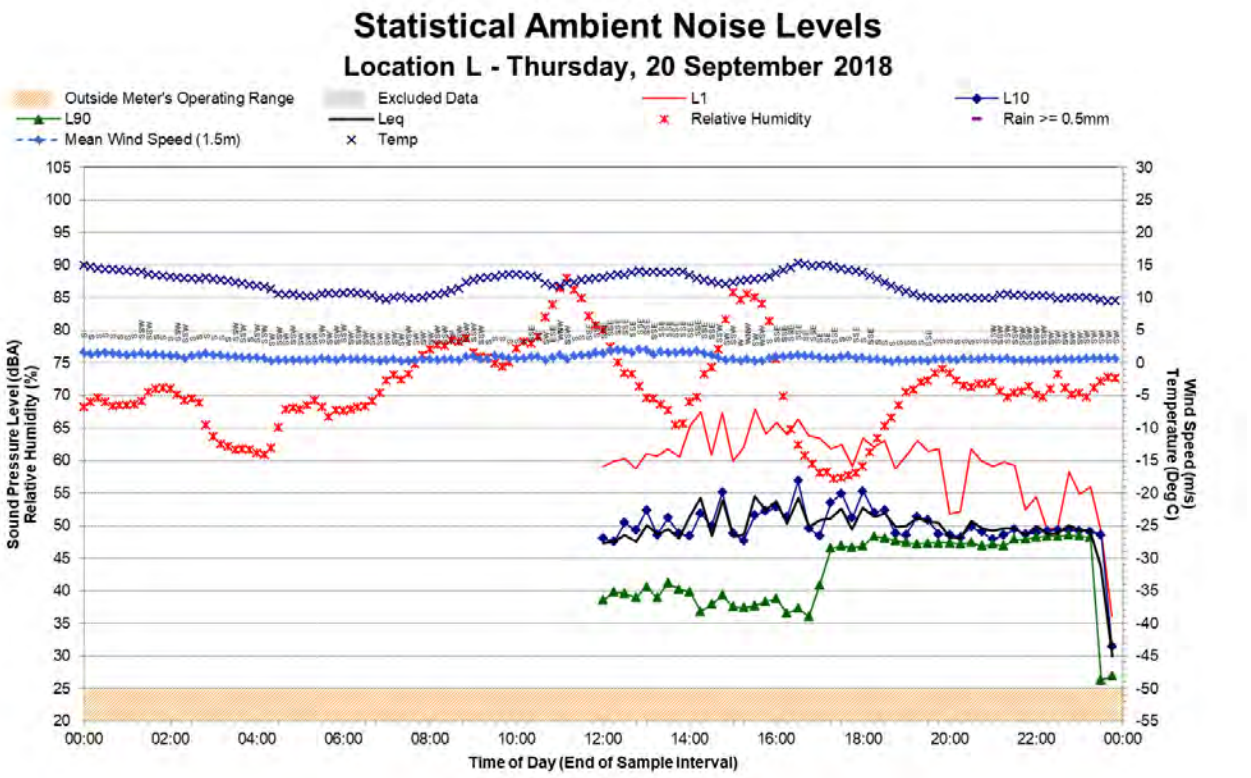
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location L - Thursday, 20 September 2018
Outside Meter's Operating Range
Excluded Data
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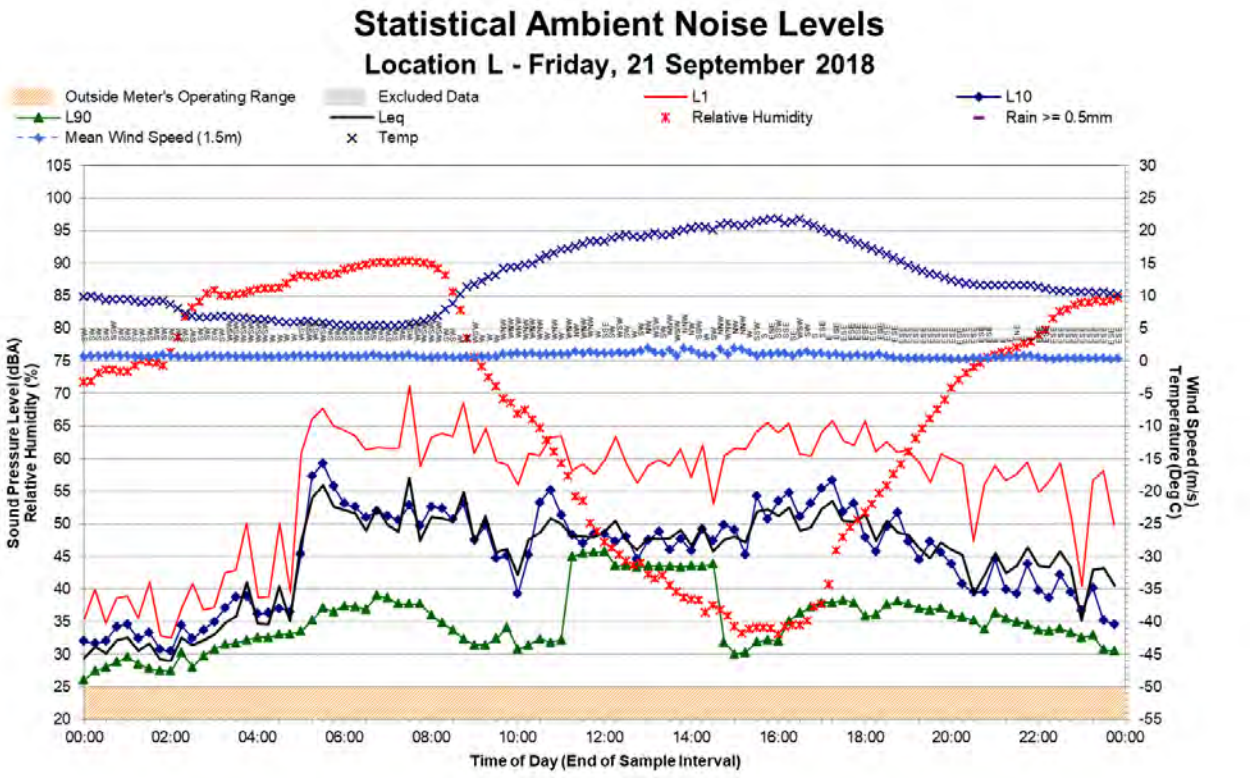
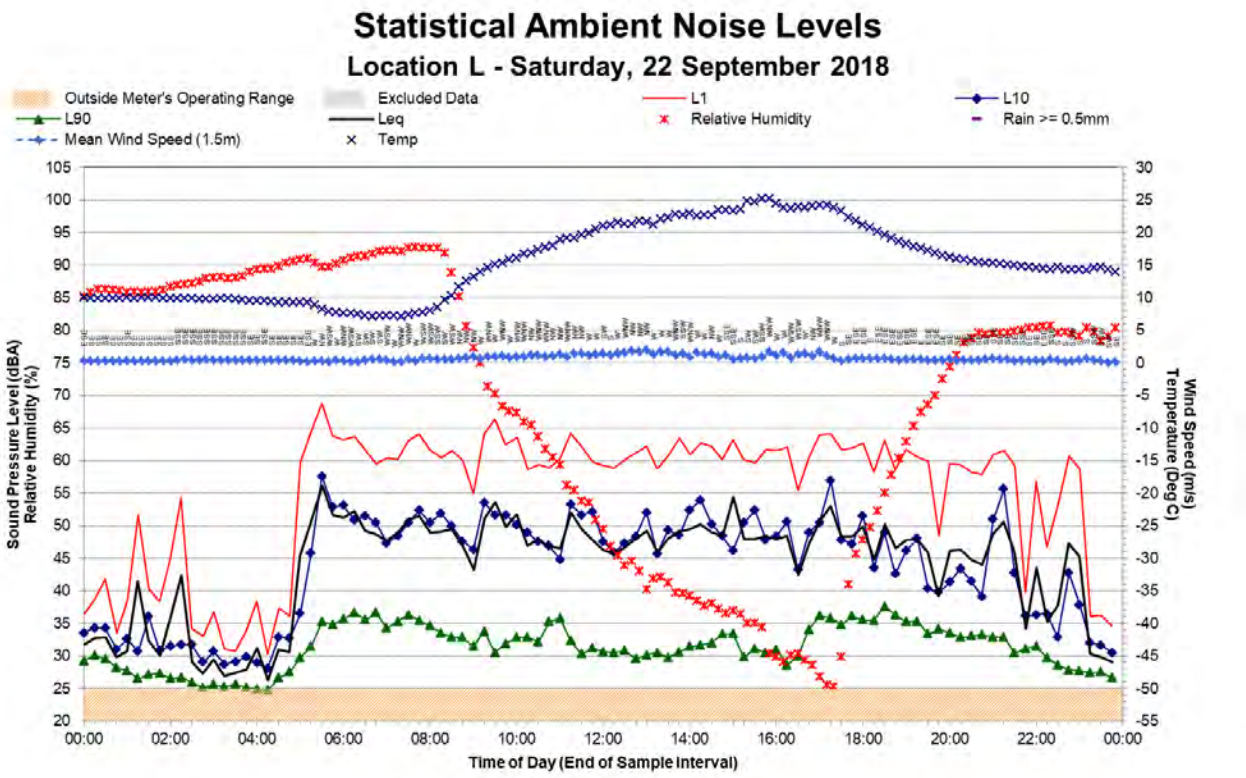
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location L - Friday, 21 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)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Location L - Saturday, 22 September 2018
Outside Meter's Operating Range
Excluded Data
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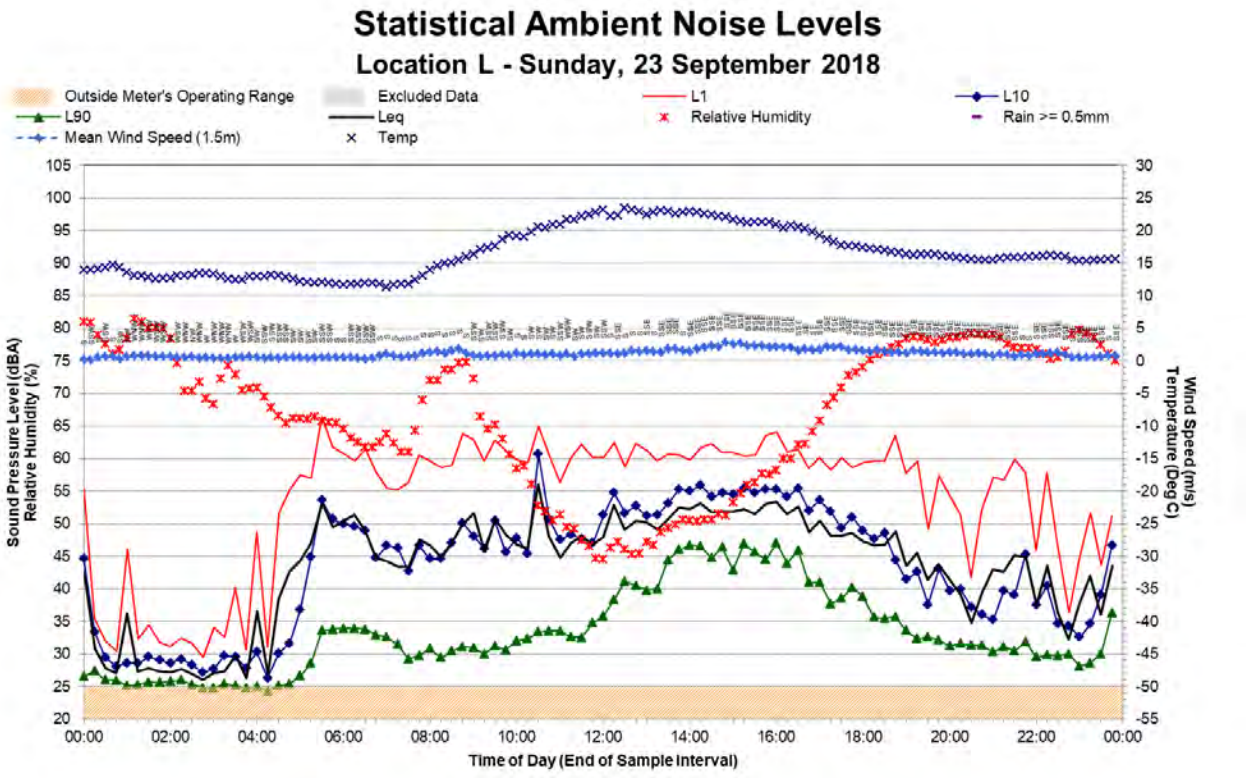
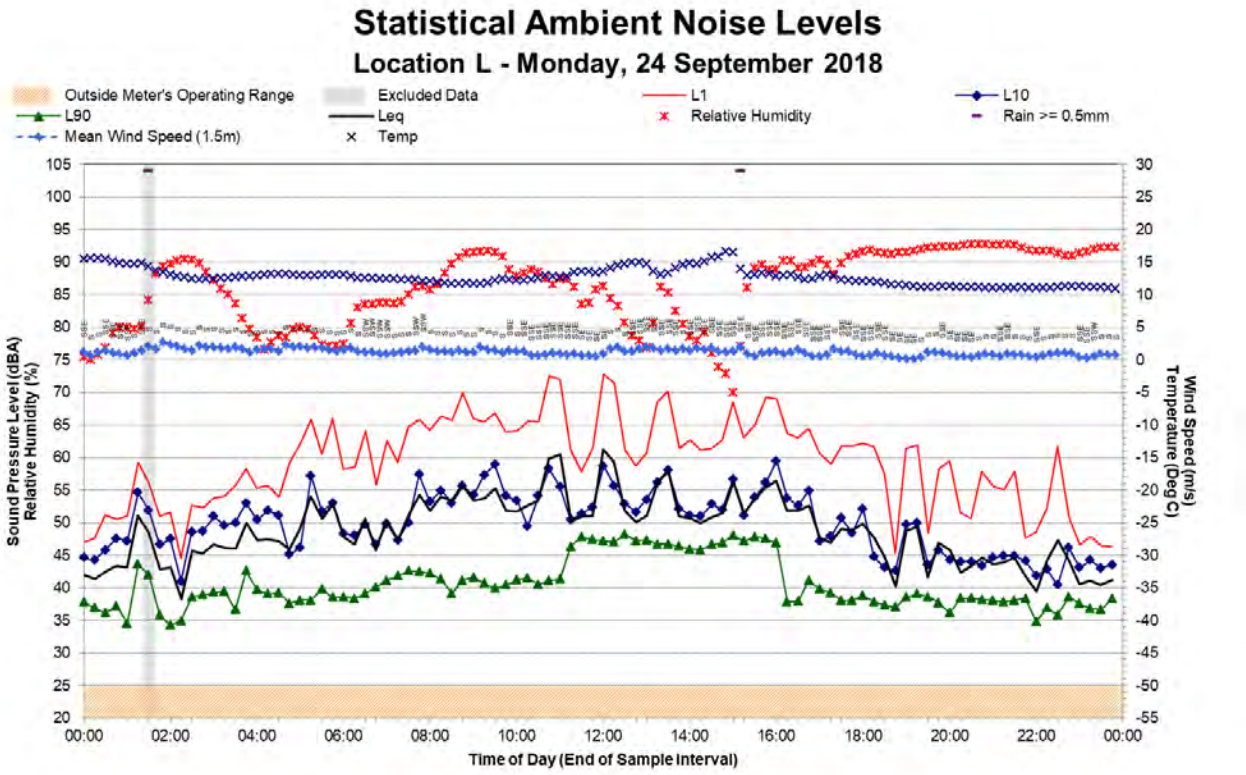
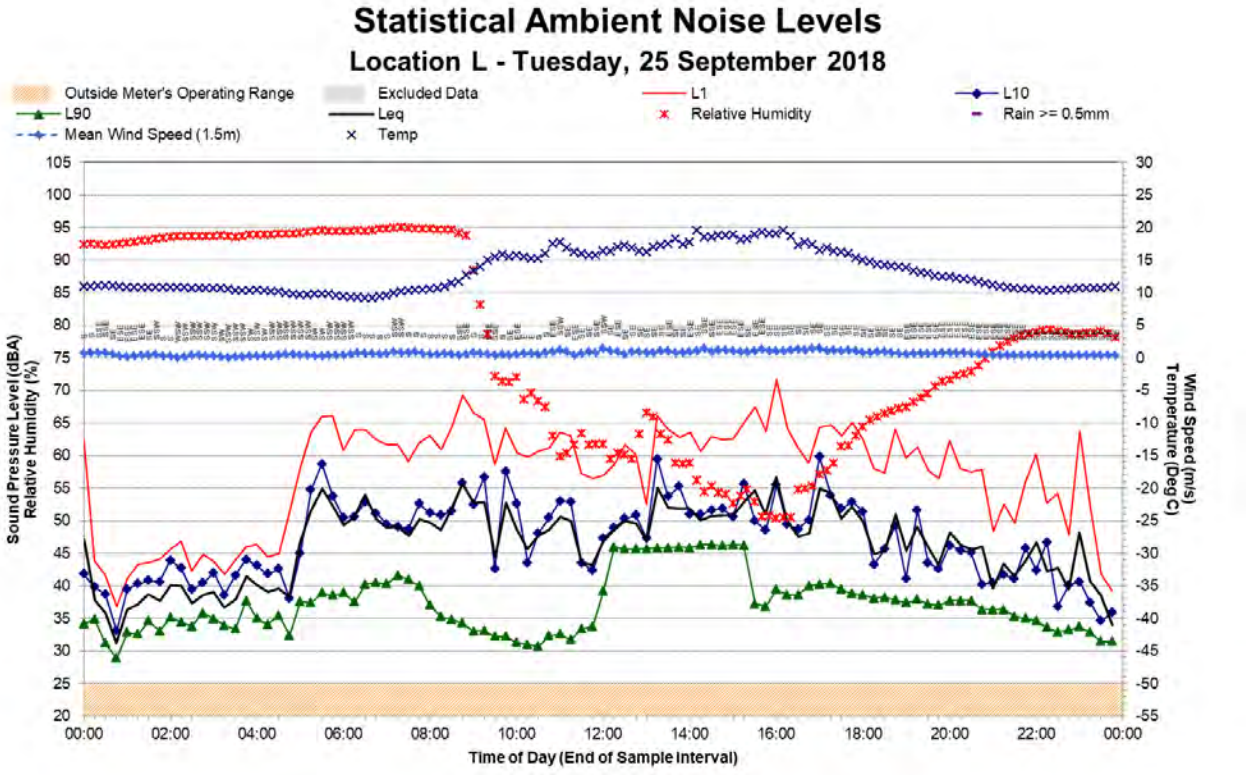
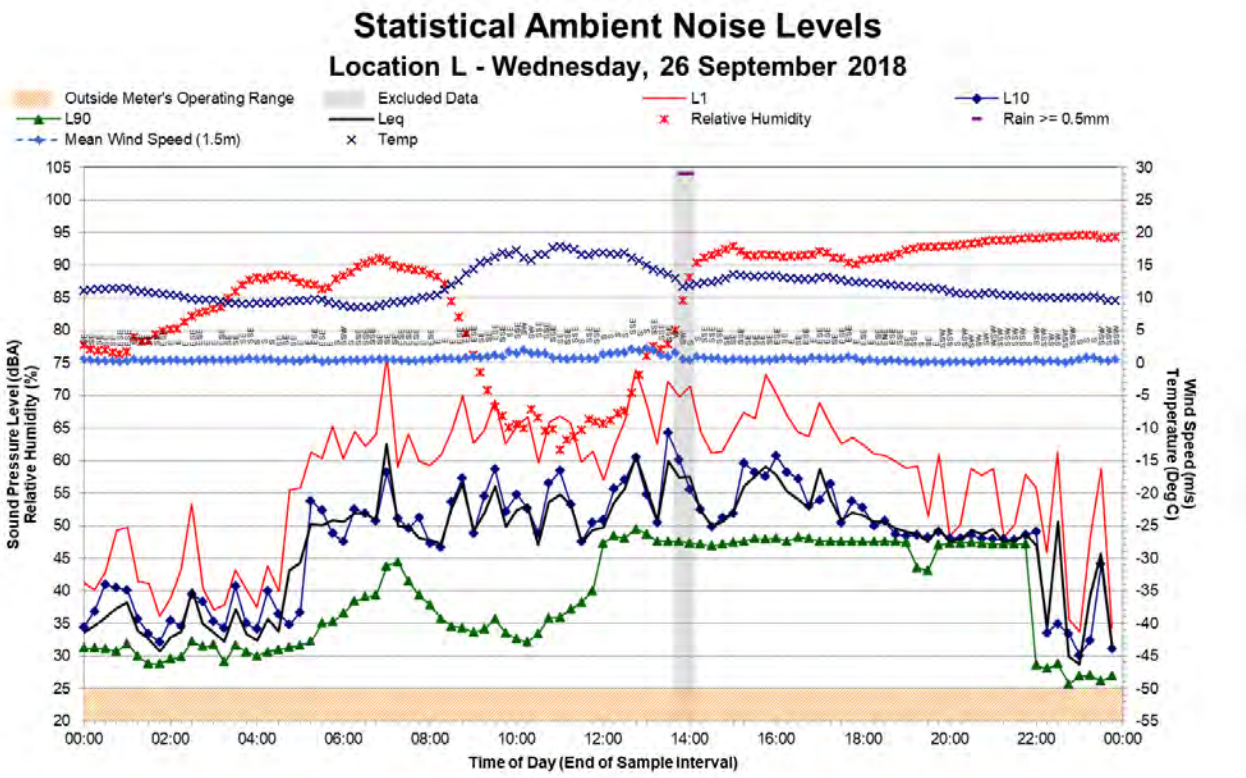
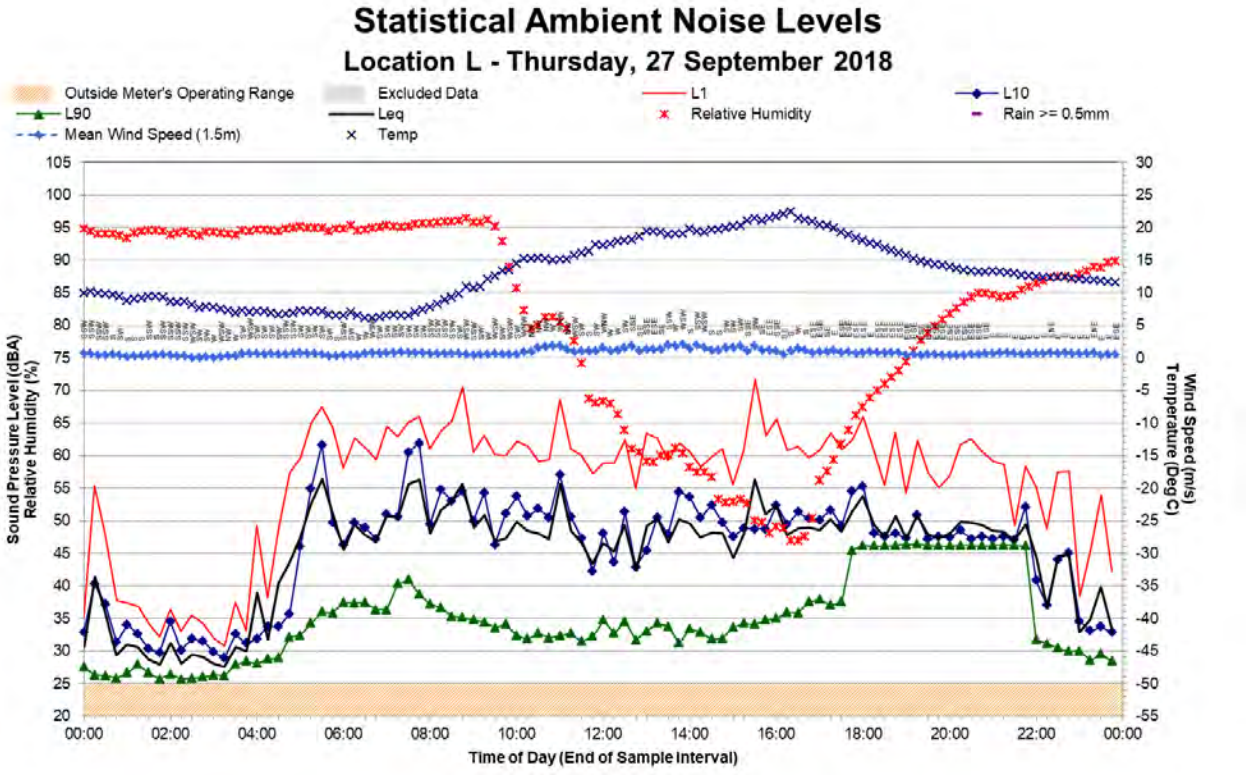
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

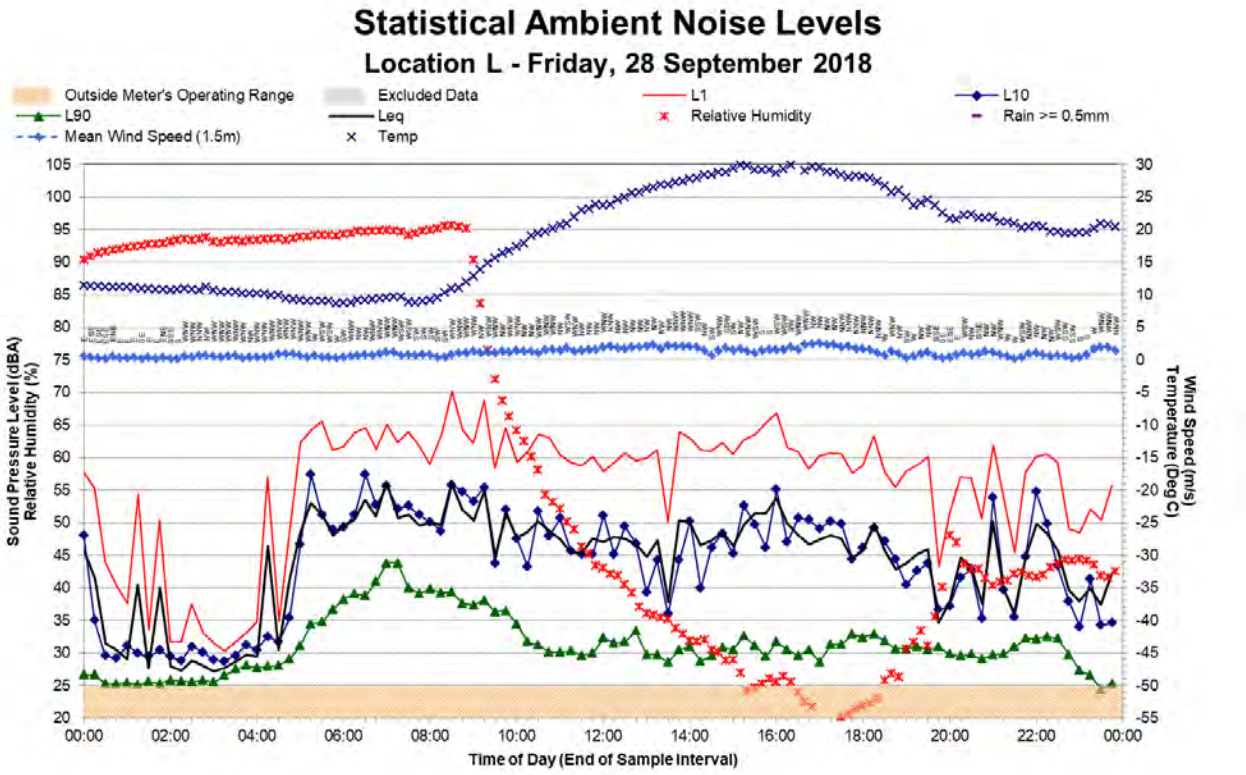

Statistical Ambient Noise Levels
Location L - Sunday, 23 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

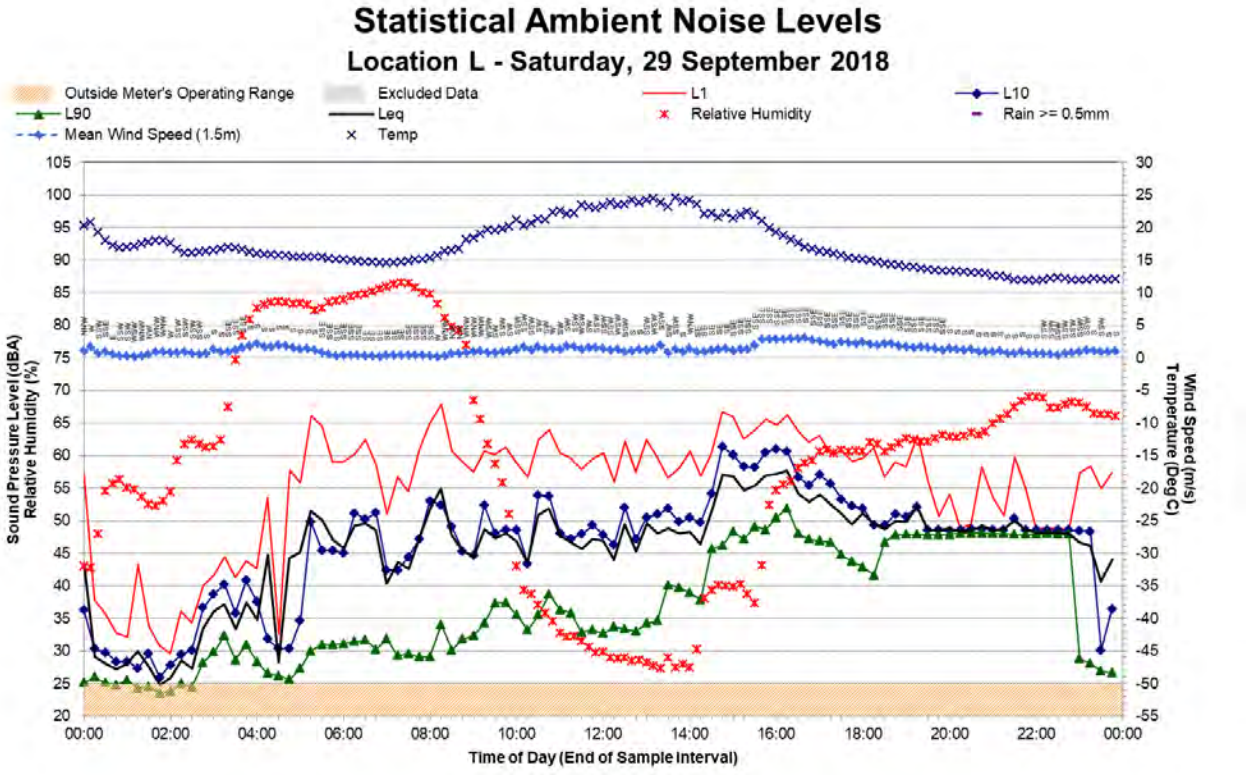

Statistical Ambient Noise Levels
Location L - Monday, 24 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

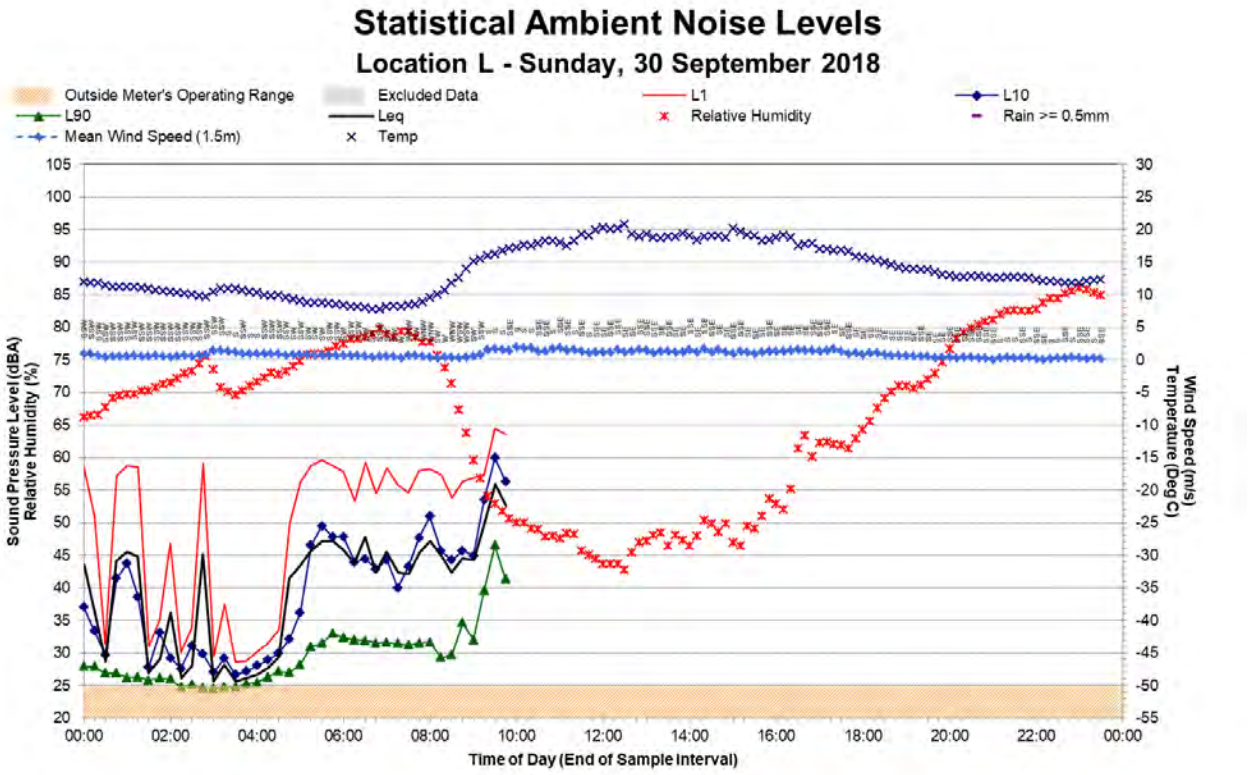

Statistical Ambient Noise Levels
Location L - Tuesday, 25 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

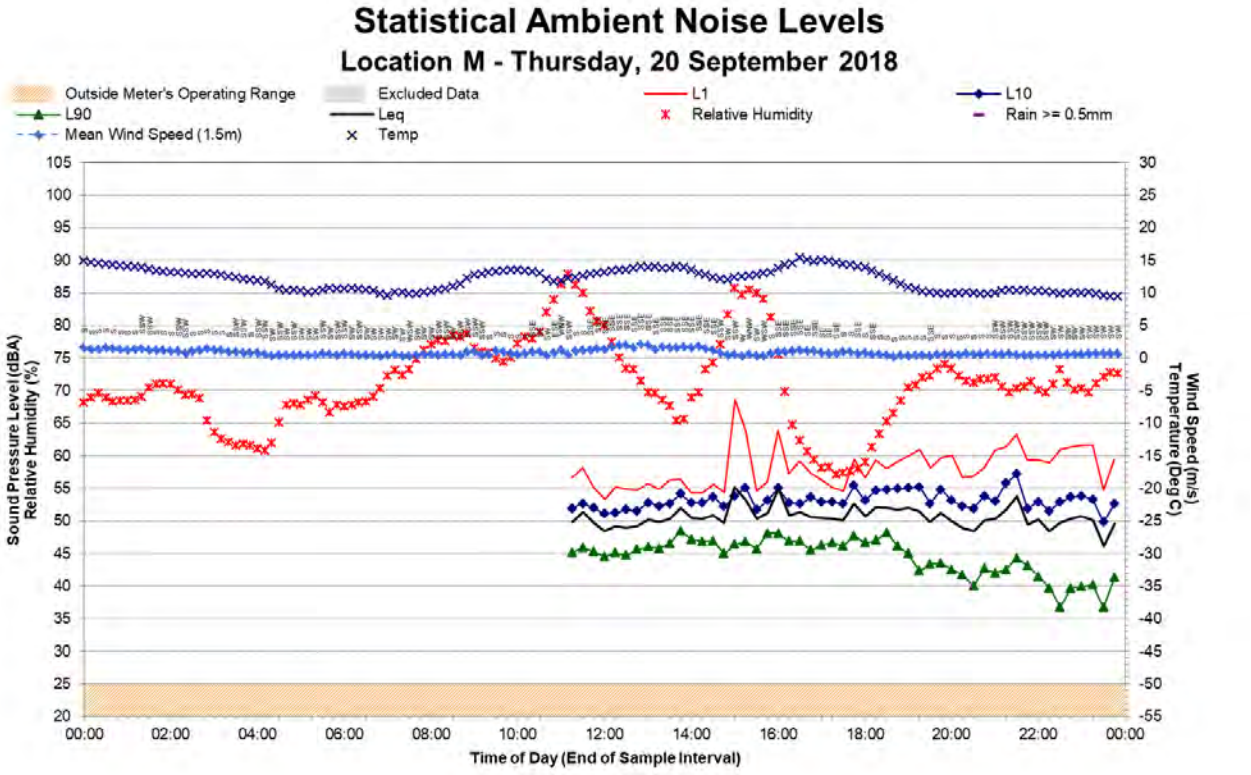

Statistical Ambient Noise Levels
Location L - Wednesday, 26 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

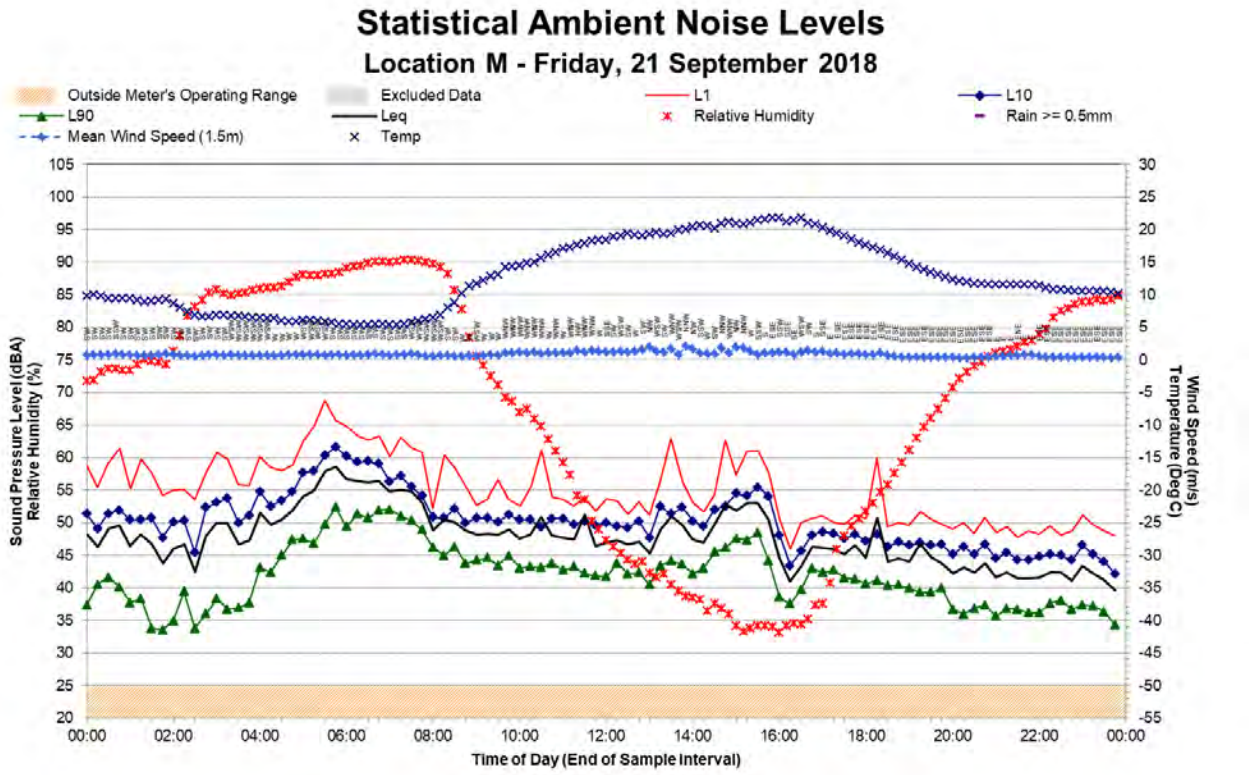

Statistical Ambient Noise Levels
Location L - Thursday, 27 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

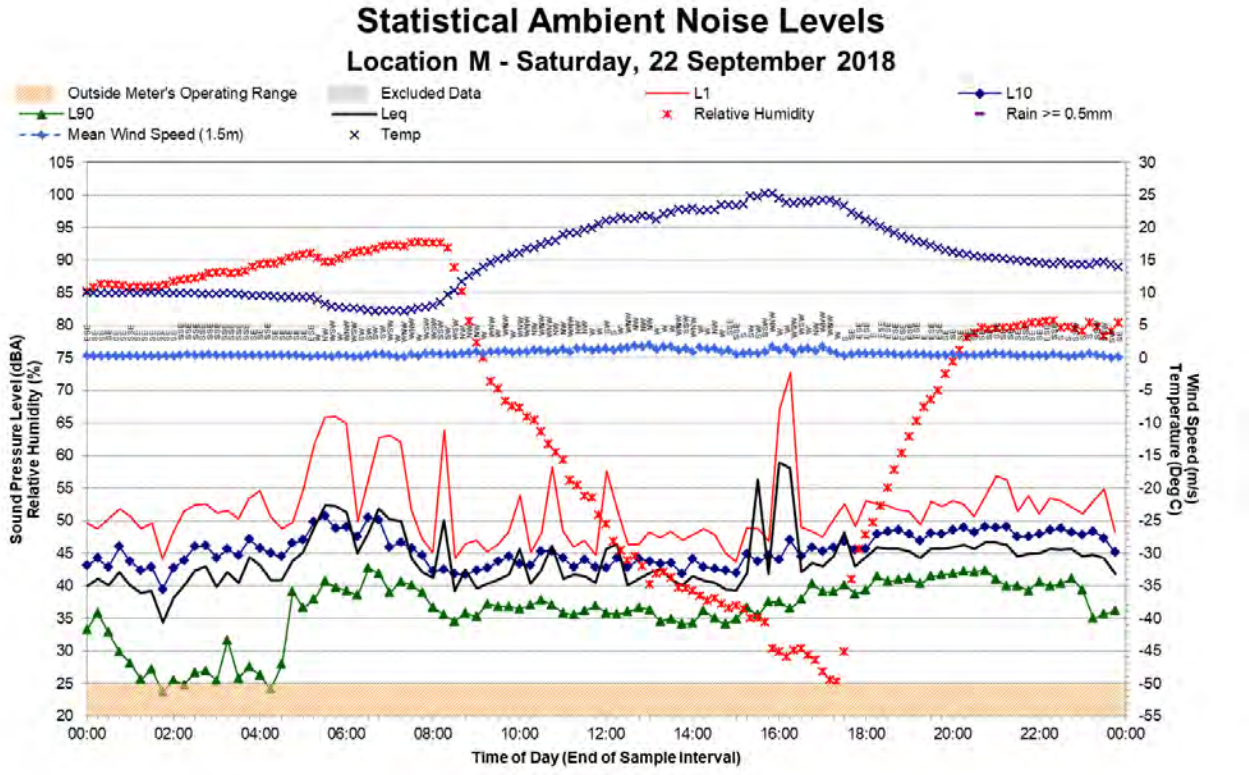

Statistical Ambient Noise Levels
Location L - Friday, 28 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

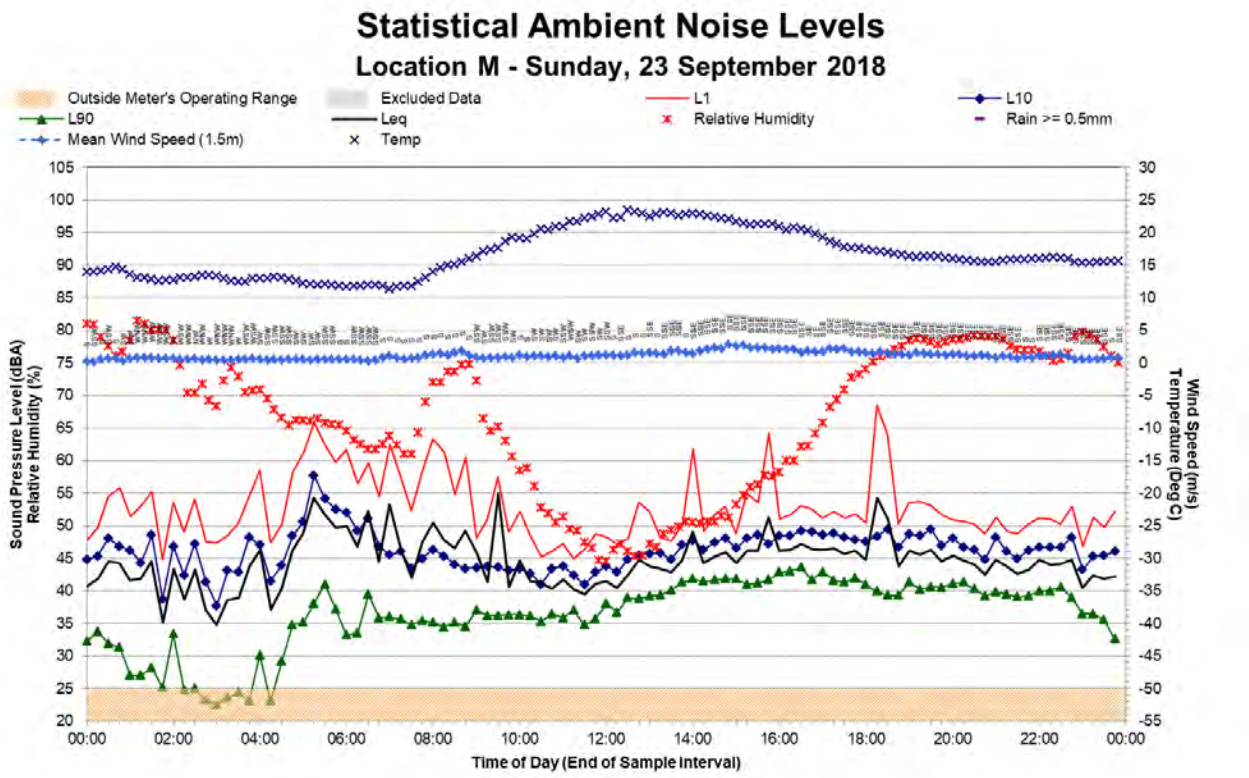

Statistical Ambient Noise Levels
Location L - Saturday, 29 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

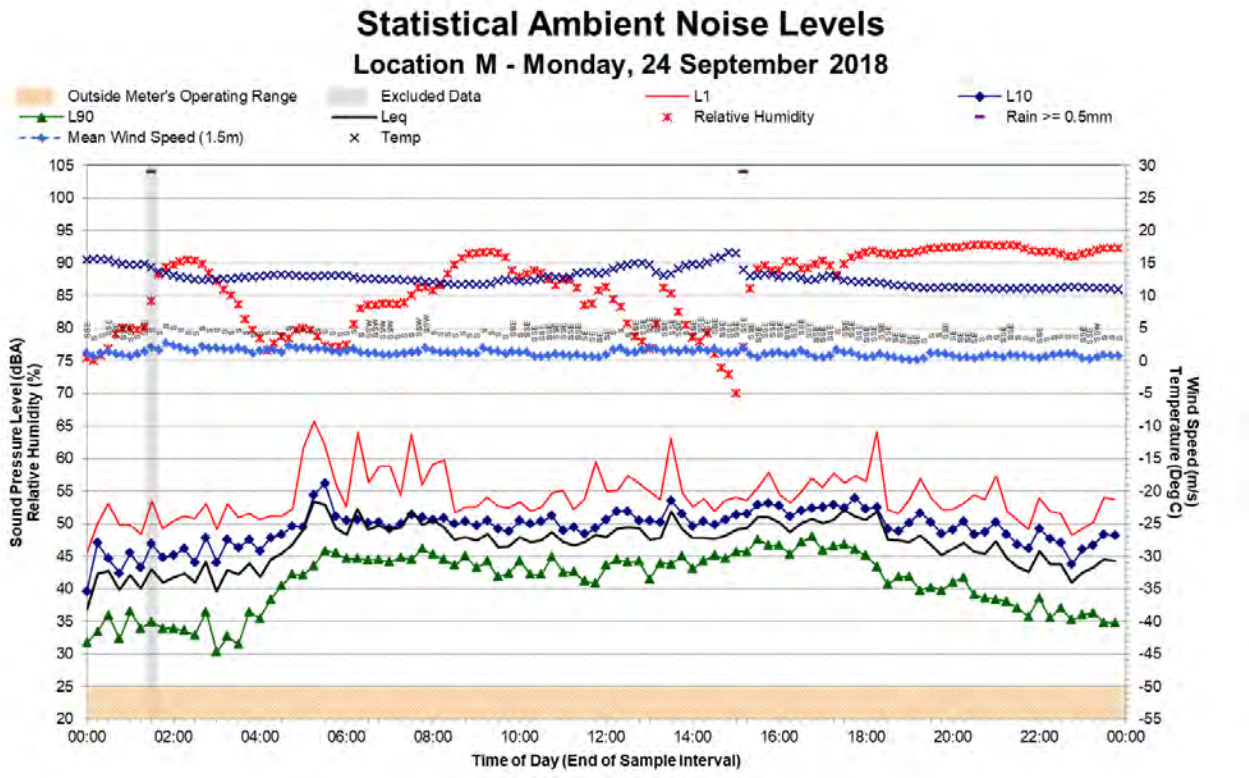

Statistical Ambient Noise Levels
Location L - Sunday, 30 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

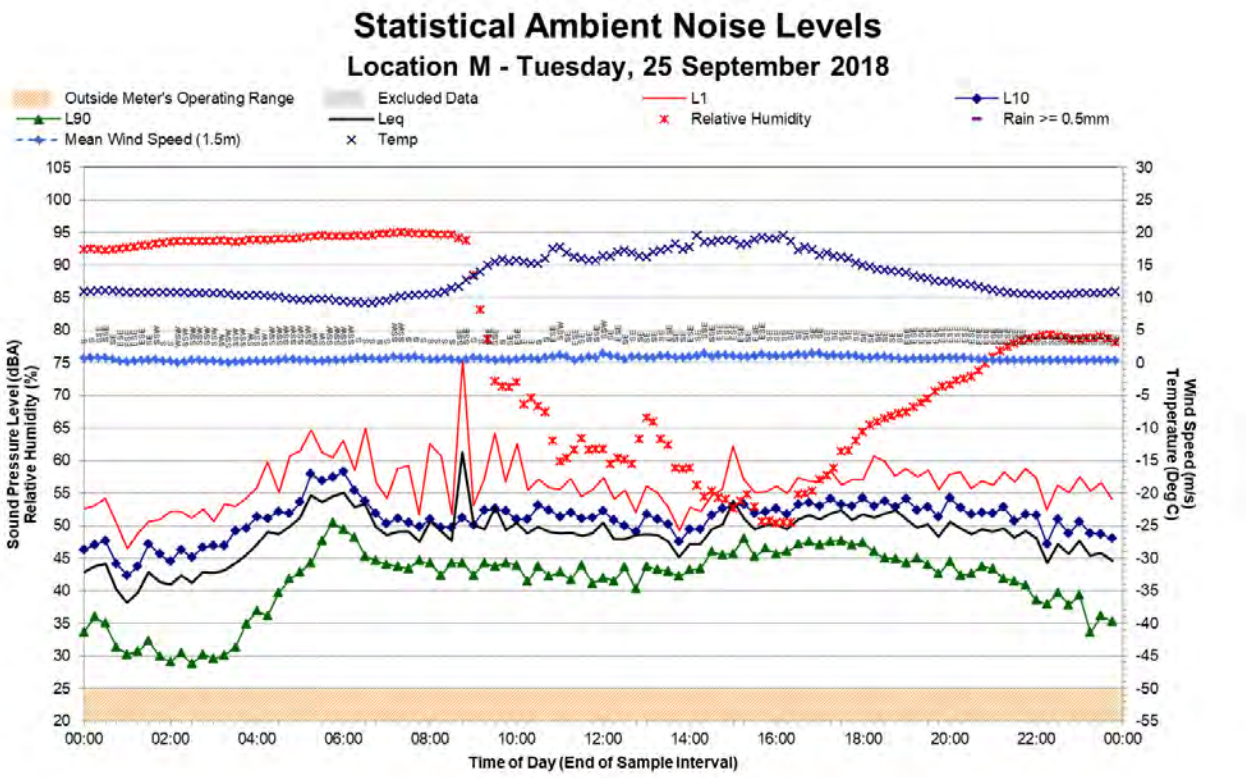

Statistical Ambient Noise Levels
Location M - Thursday, 20 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

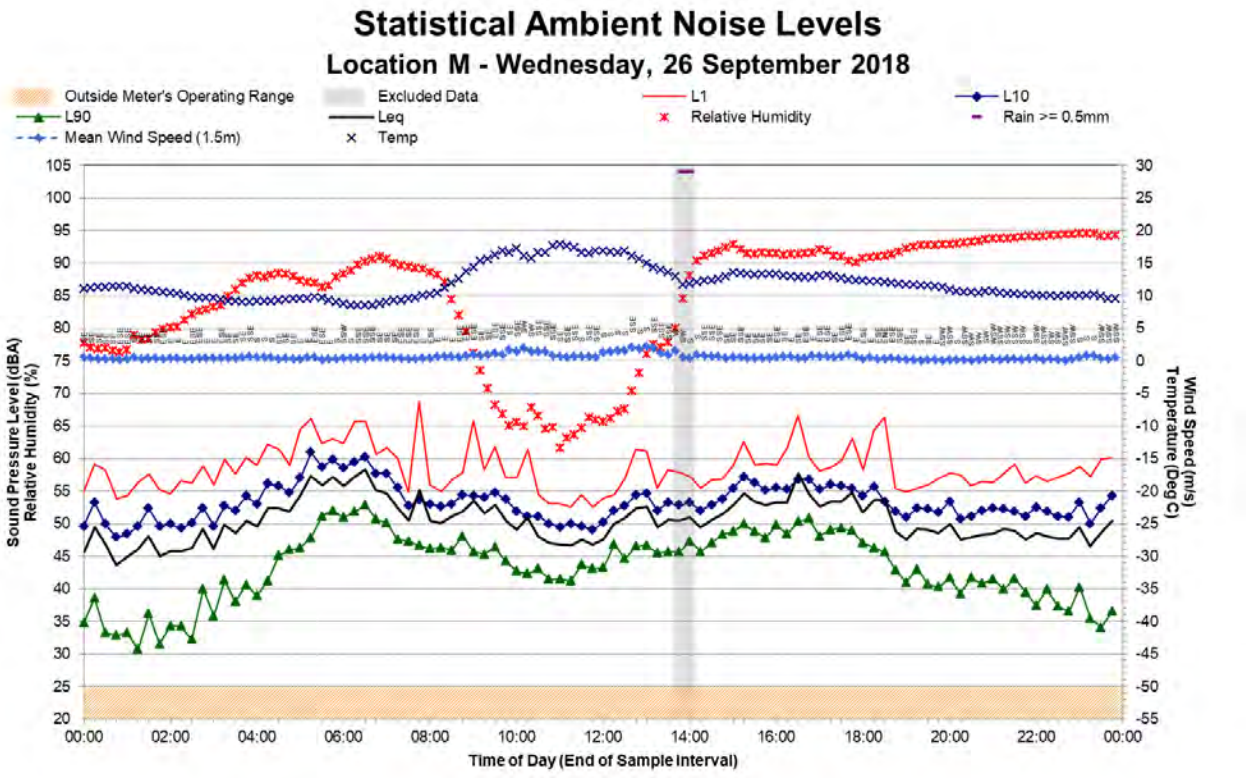

Statistical Ambient Noise Levels
Location M - Friday, 21 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

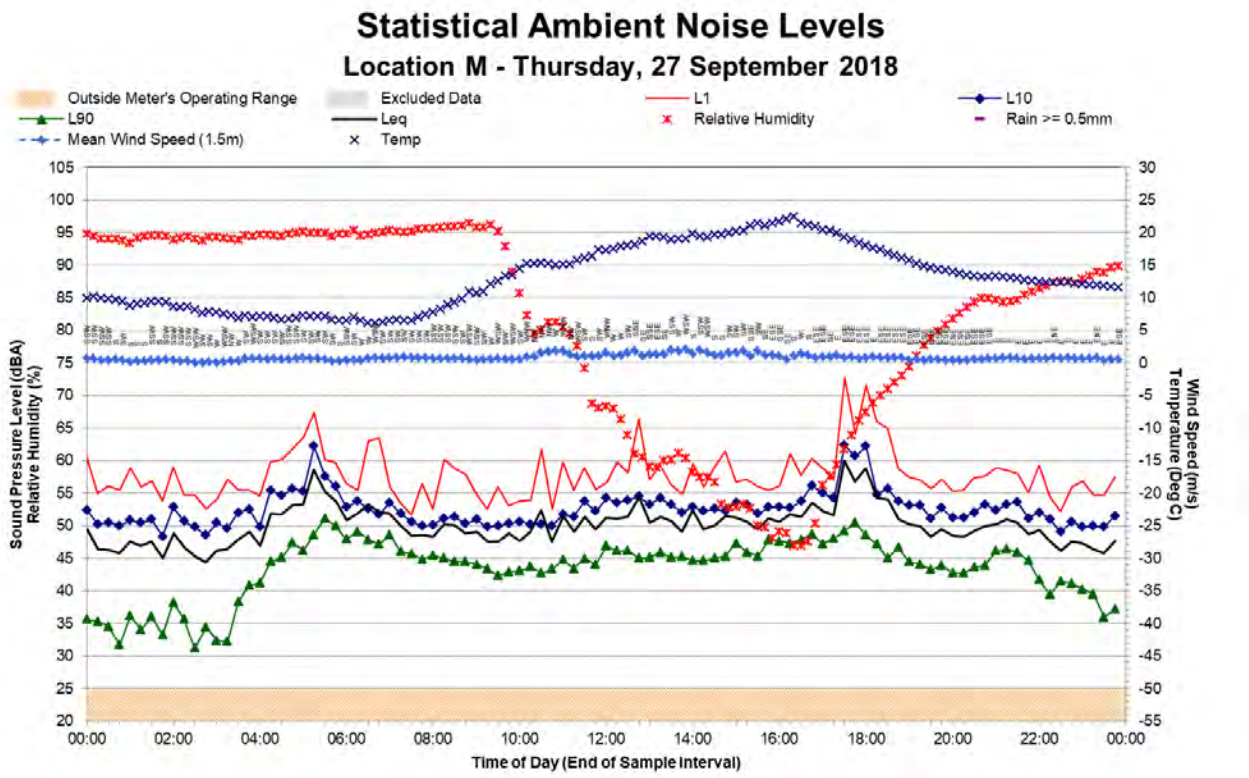

Statistical Ambient Noise Levels
Location M - Saturday, 22 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

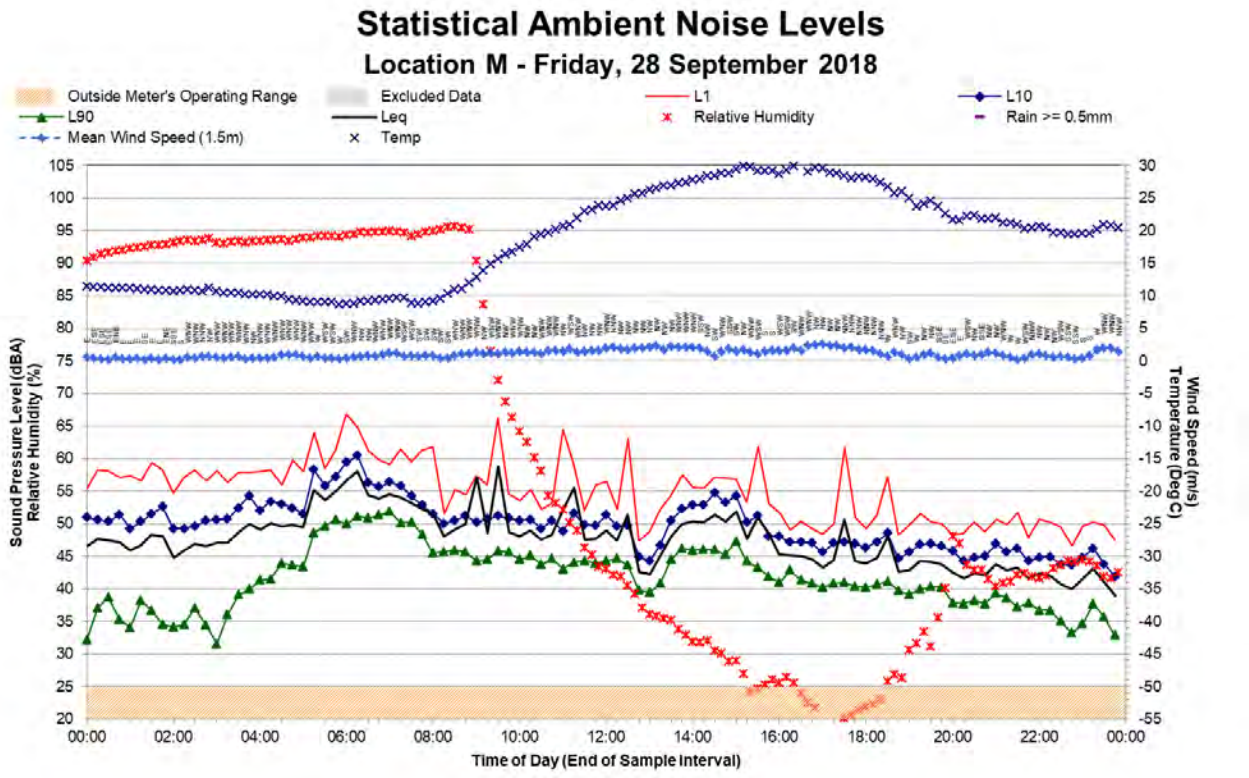

Statistical Ambient Noise Levels
Location M - Sunday, 23 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

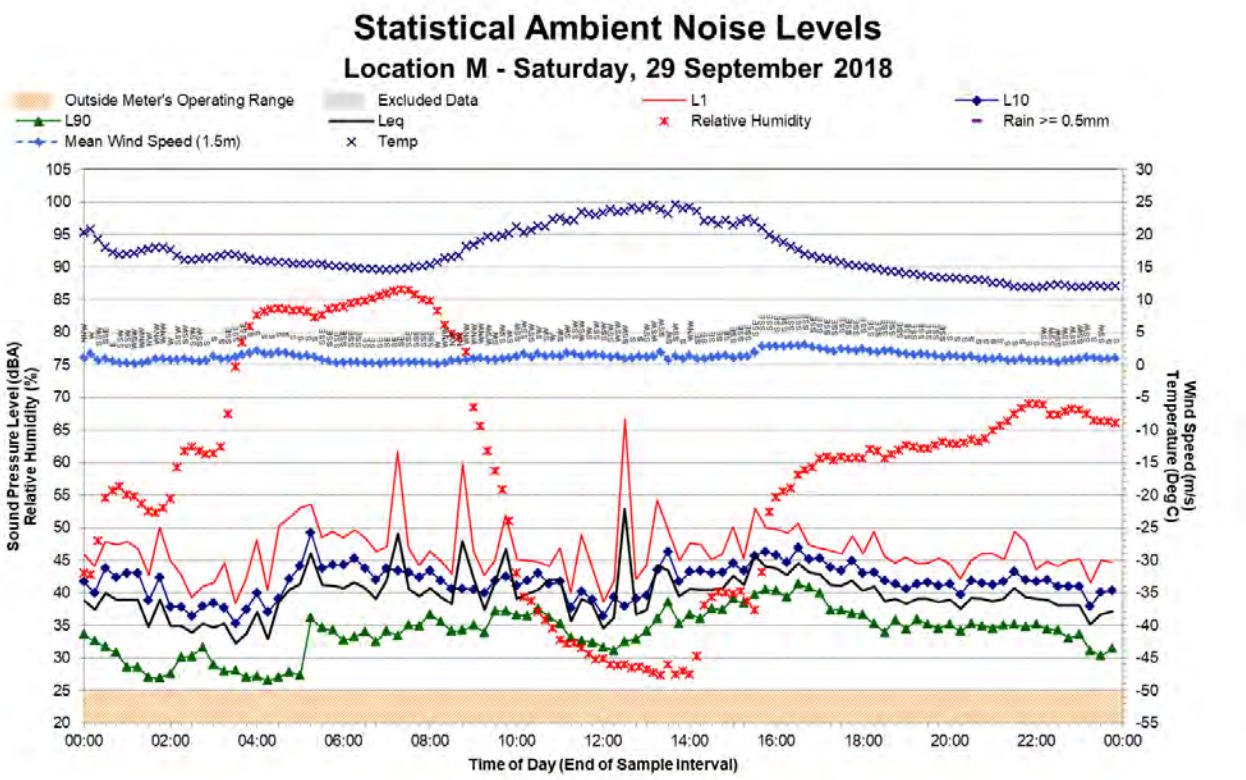

Statistical Ambient Noise Levels
Location M - Monday, 24 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

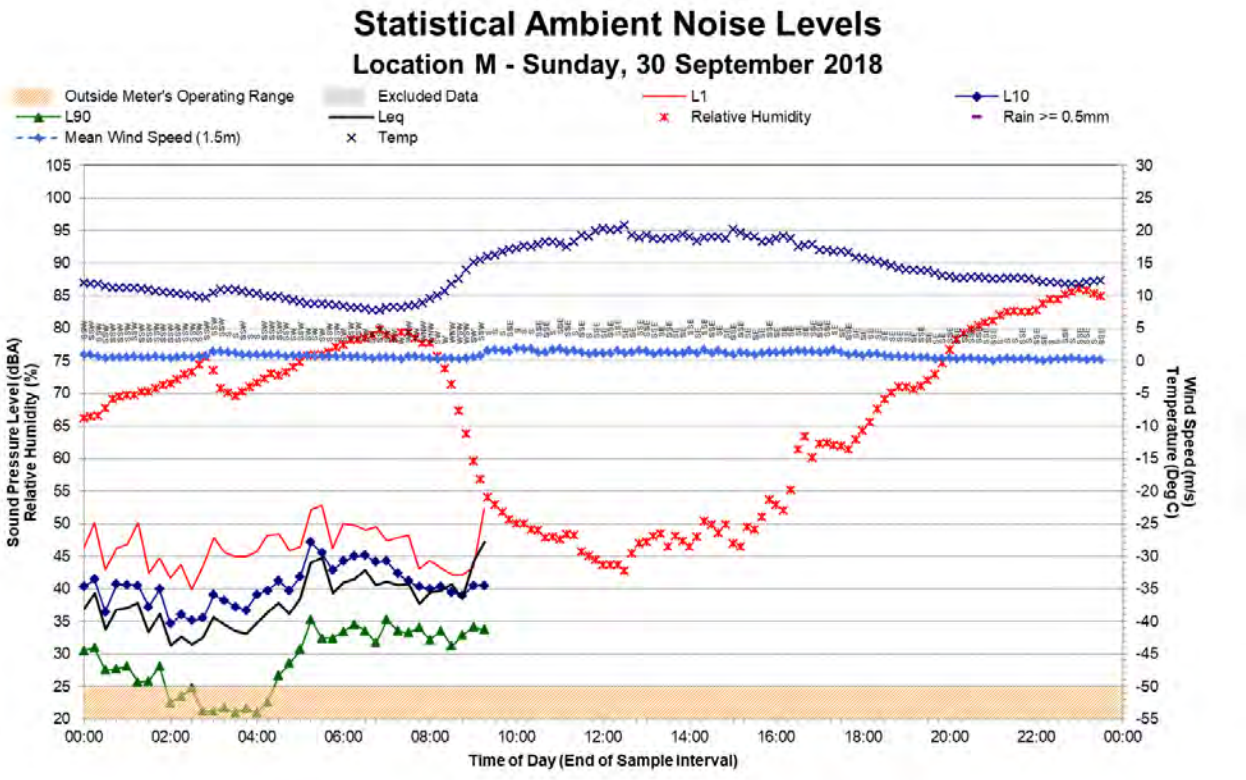

Statistical Ambient Noise Levels
Location M - Tuesday, 25 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

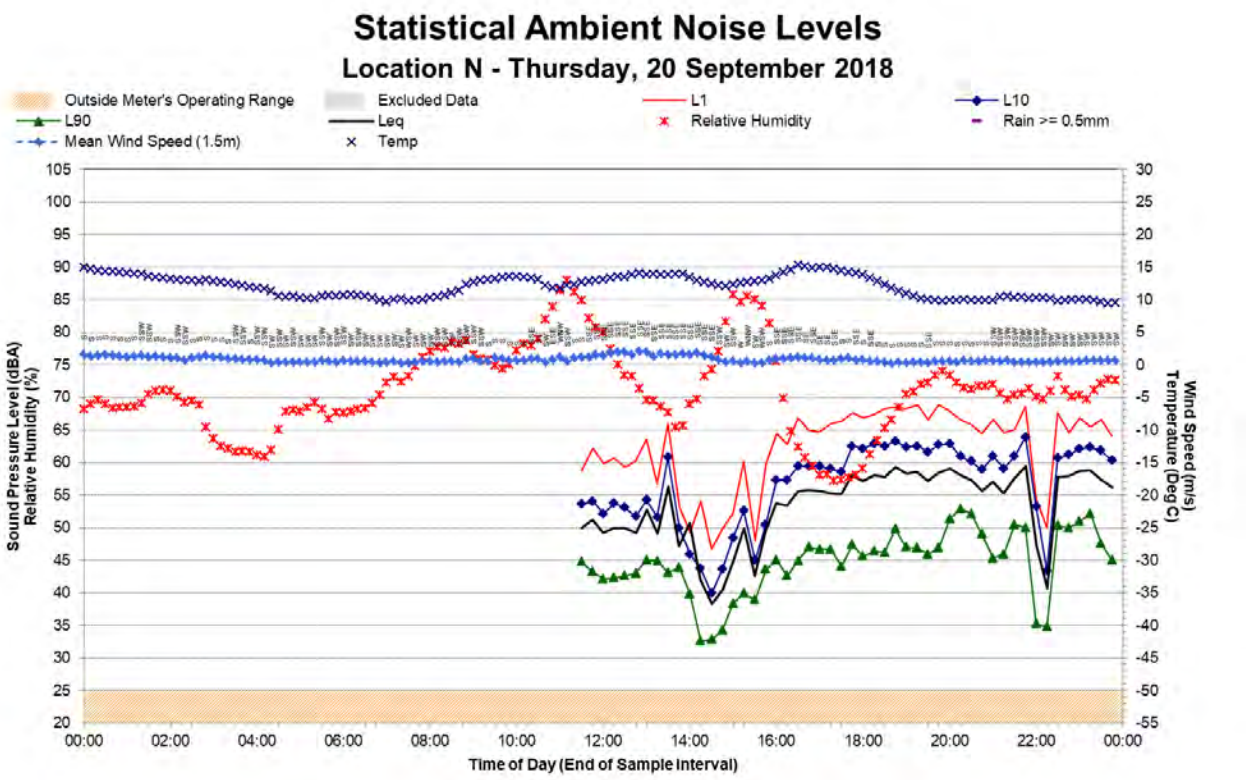

Statistical Ambient Noise Levels
Location M - Wednesday, 26 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

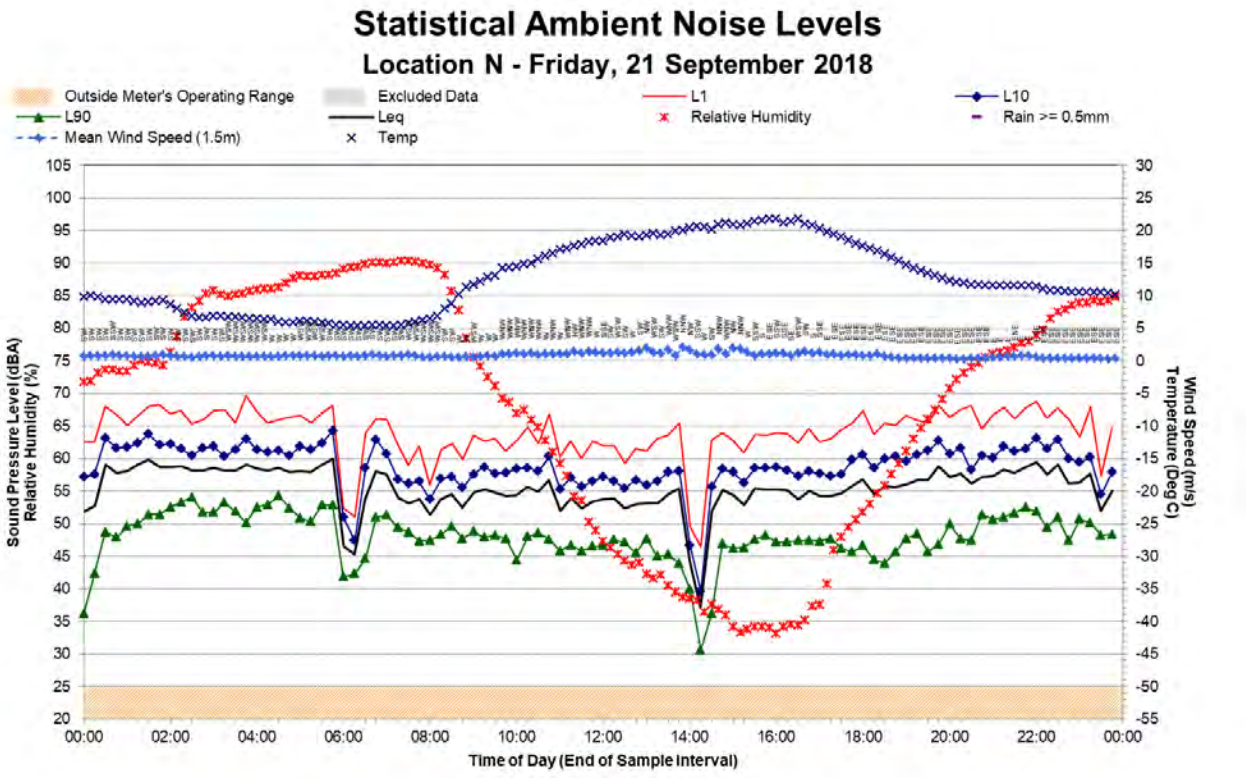

Statistical Ambient Noise Levels
Location M - Thursday, 27 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location M - Friday, 28 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location M - Saturday, 29 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location M - Sunday, 30 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Thursday, 20 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Friday, 21 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
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Sound Pressure Level (dBA)
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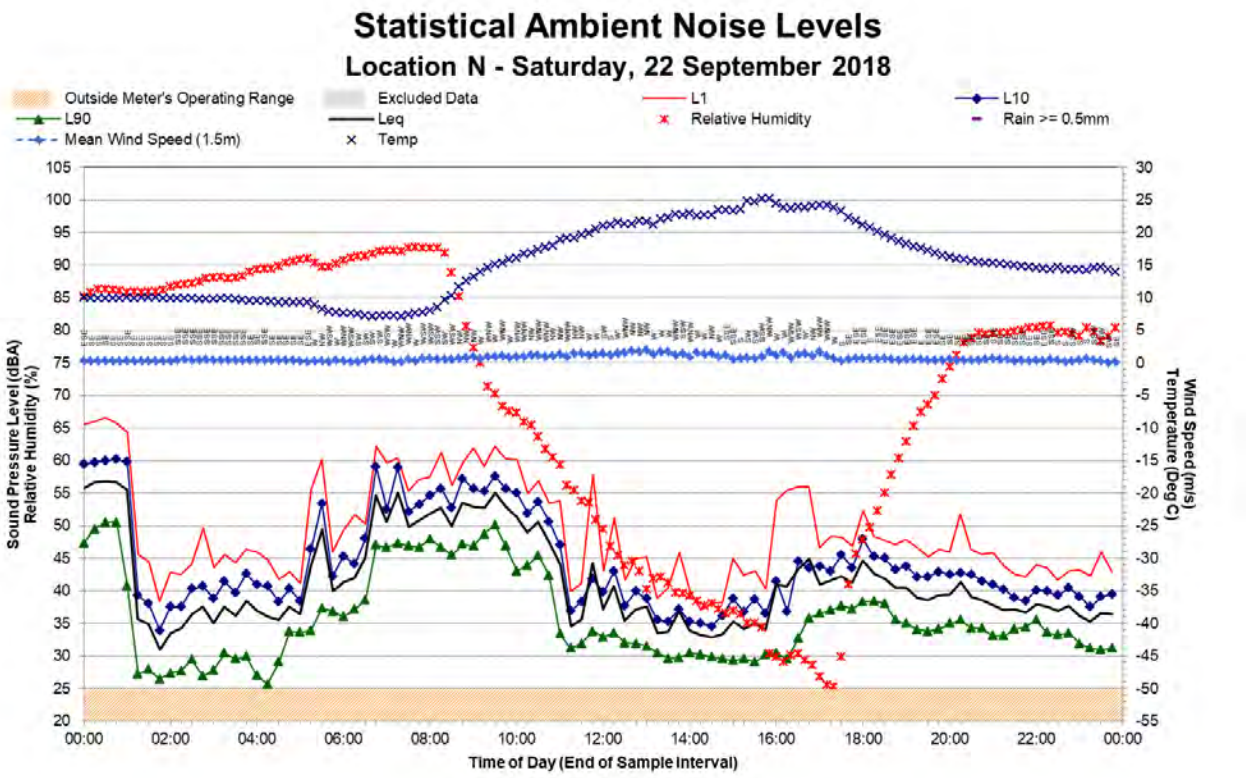
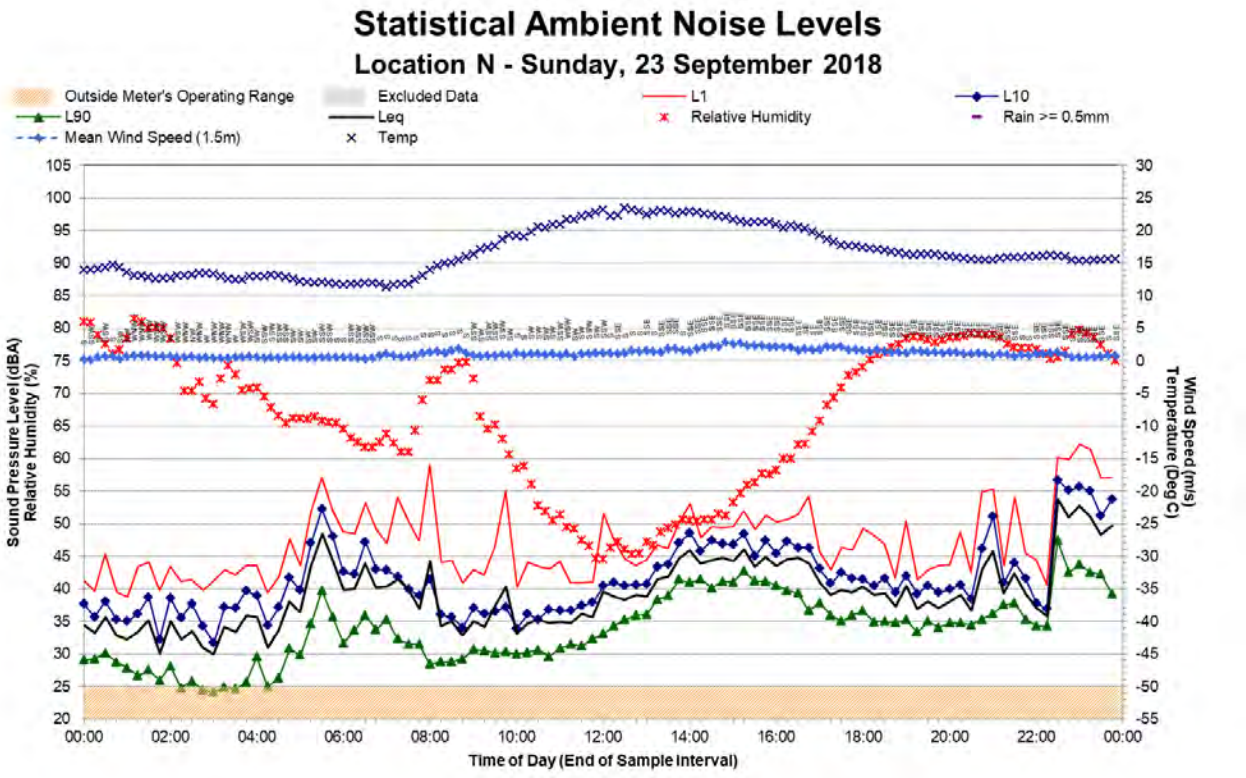
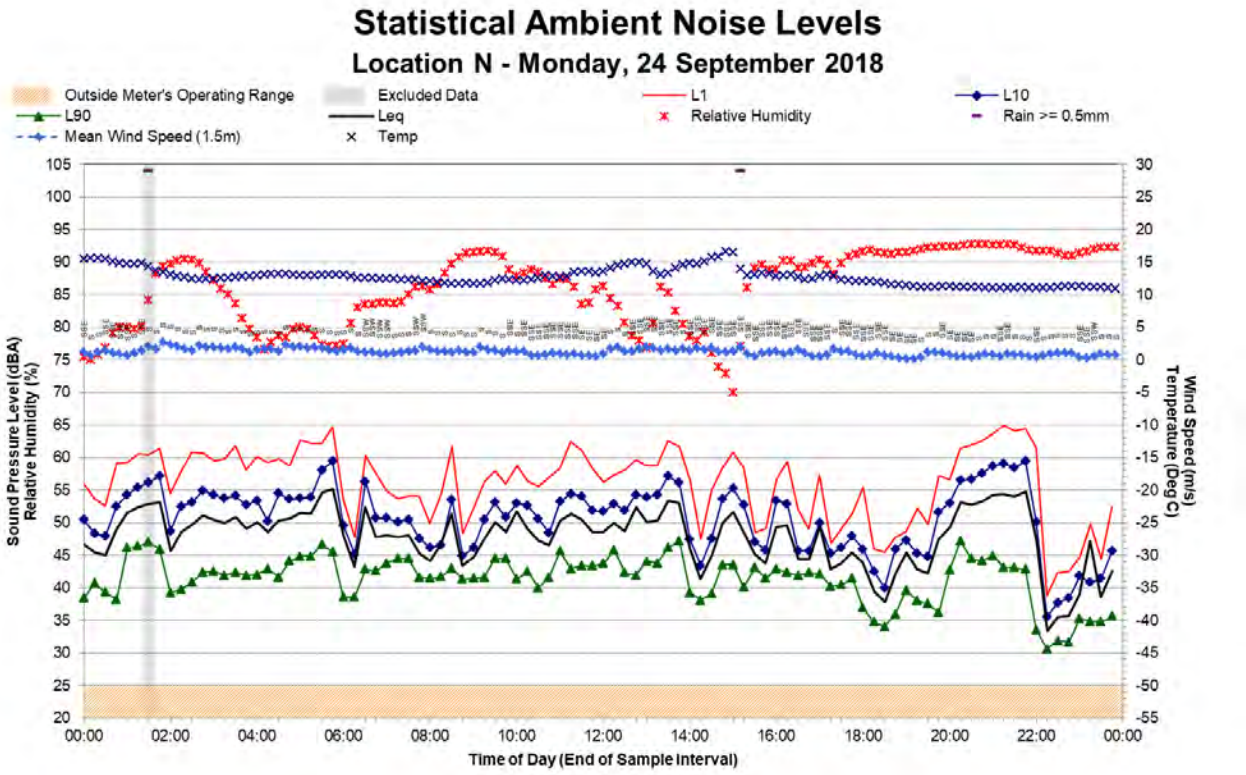
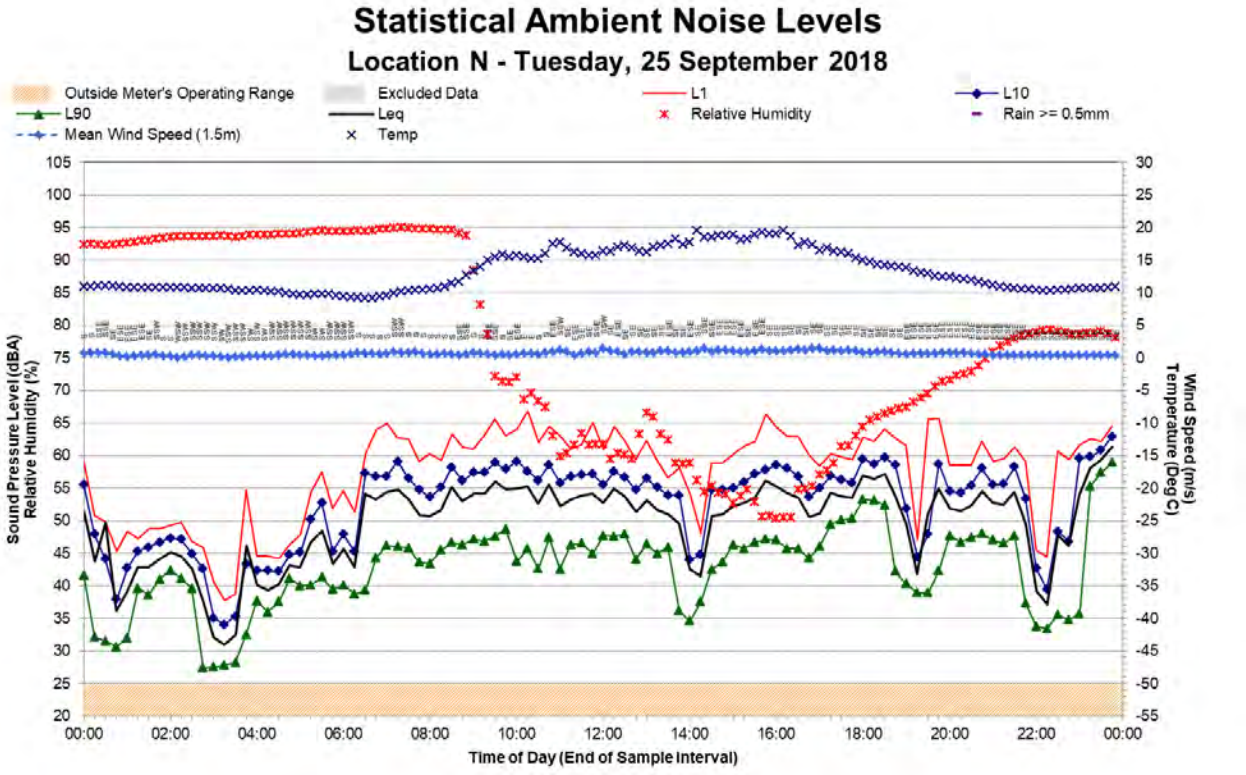
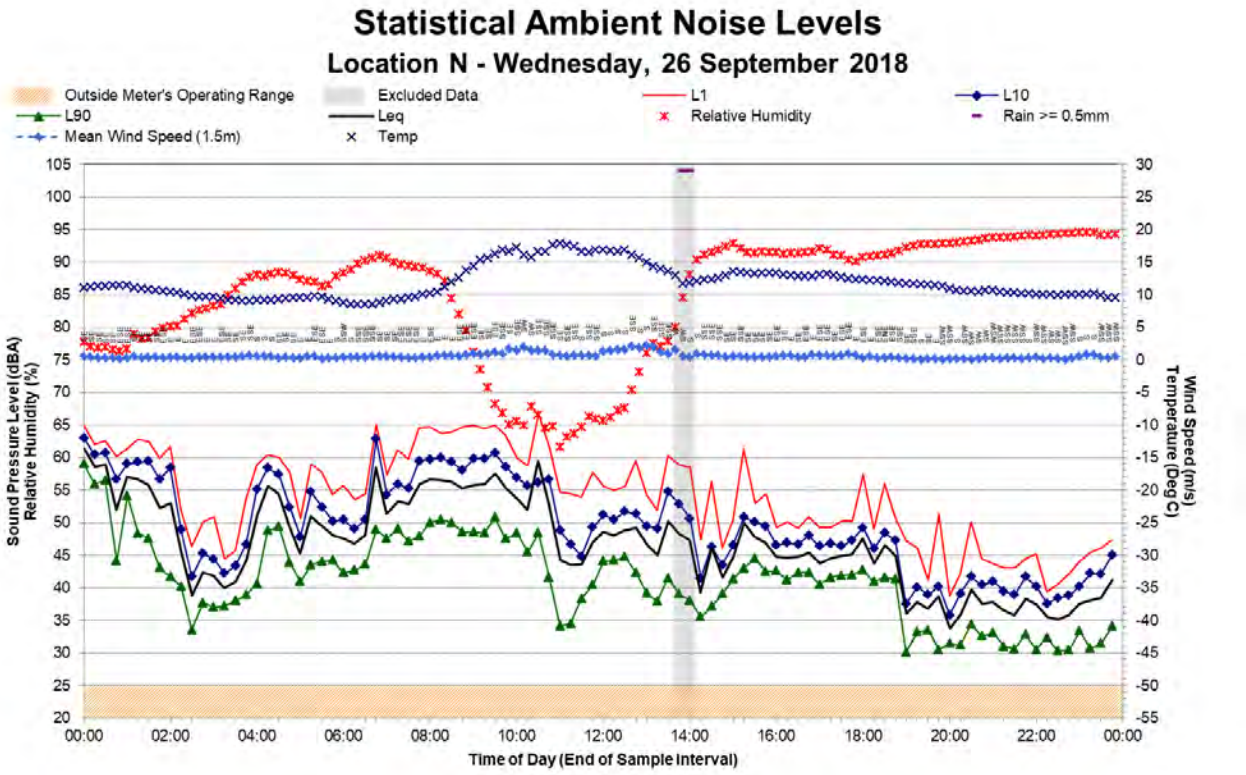
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

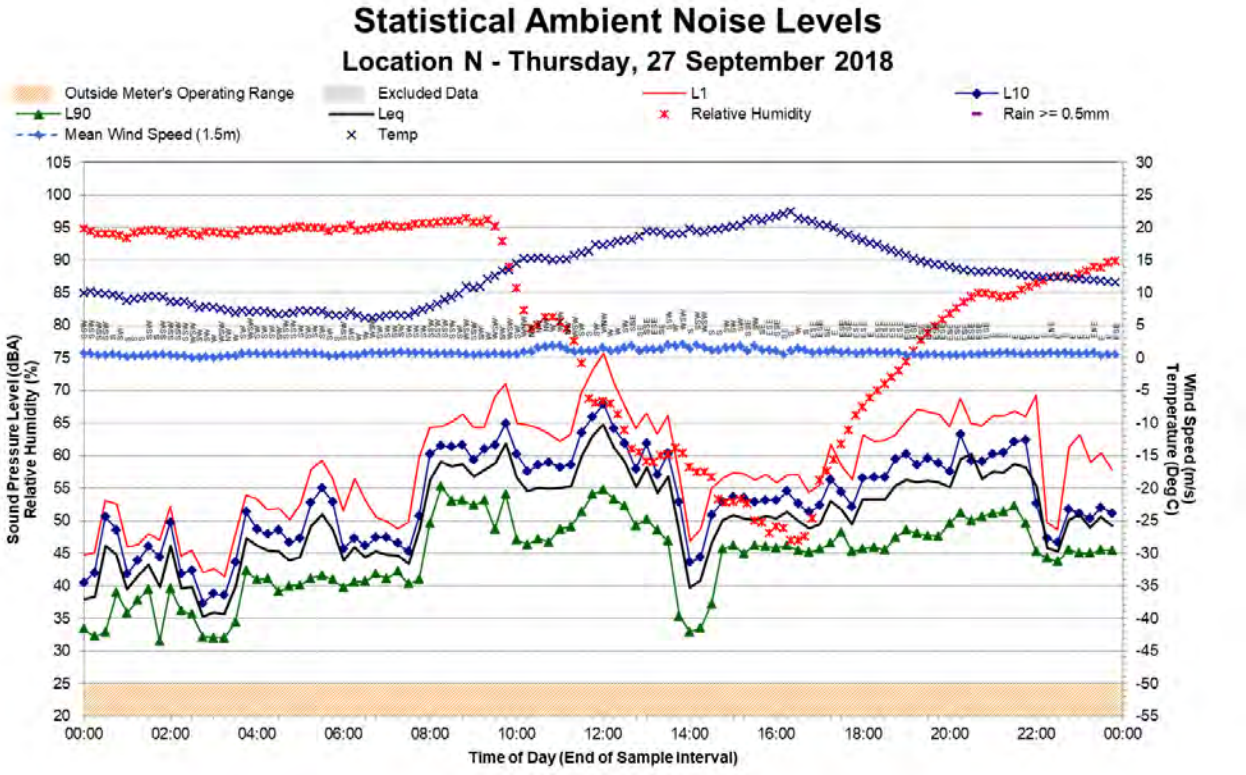

Statistical Ambient Noise Levels
Location N - Saturday, 22 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

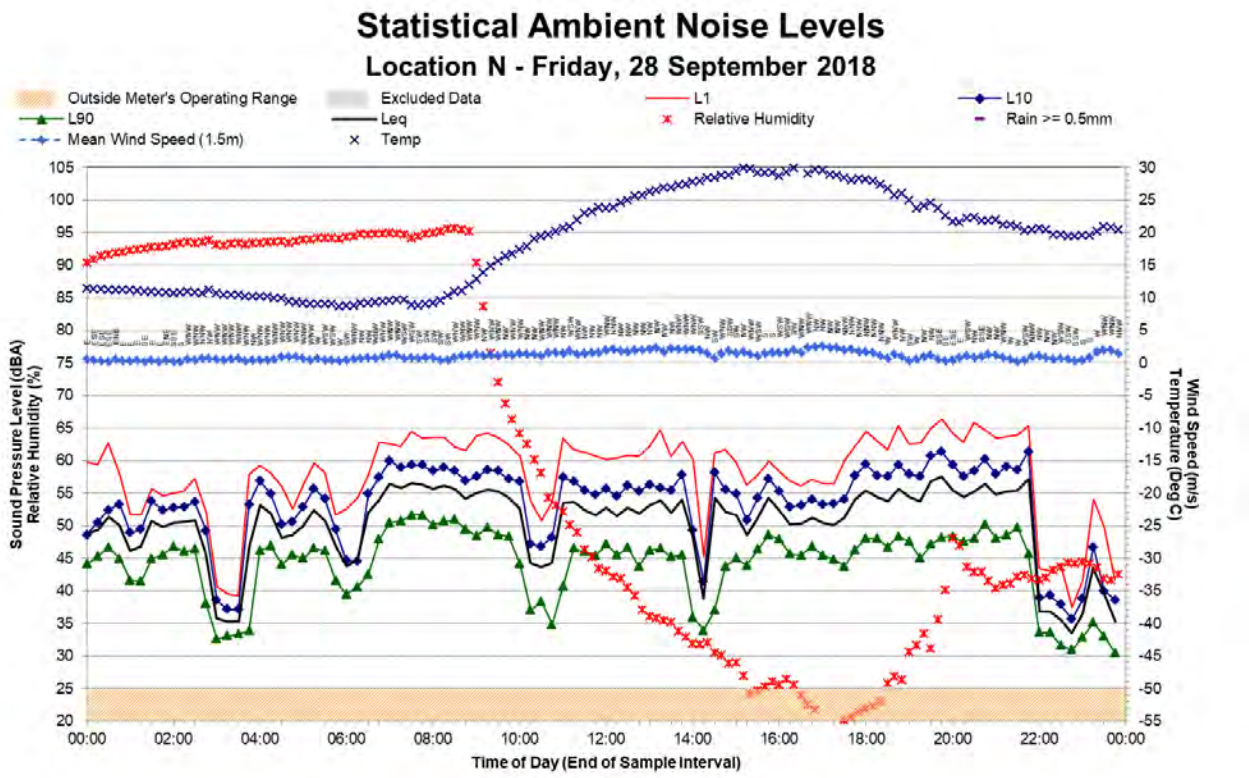

Statistical Ambient Noise Levels
Location N - Sunday, 23 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

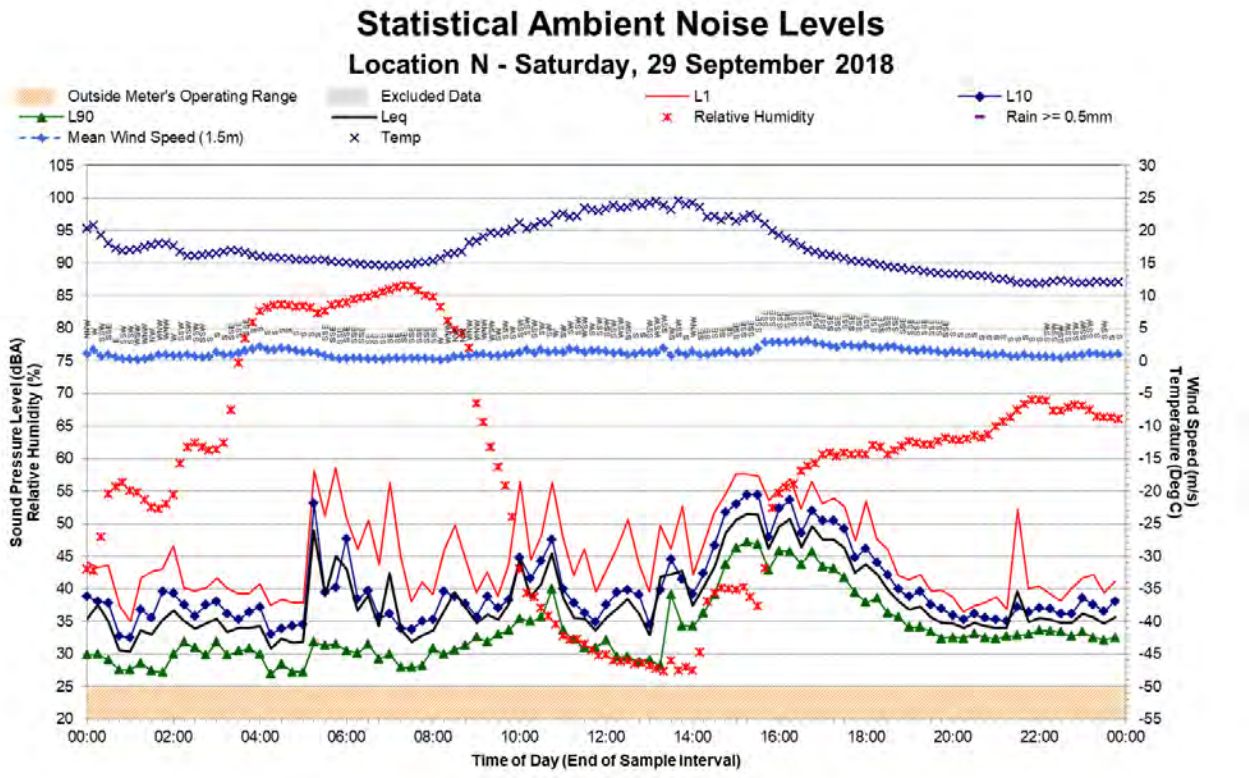

Statistical Ambient Noise Levels
Location N - Monday, 24 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Tuesday, 25 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Wednesday, 26 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Thursday, 27 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Friday, 28 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Location N - Saturday, 29 September 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

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Auckland 1010
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Port Nelson 7010
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Level 2, 10 Devon Street East
New Plymouth 4310
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T: +64 0800 757 695